

Canadian 24-Hour Movement Guidelines for Adults aged 18–64 years and Adults aged 65 years or older: an integration of physical activity, sedentary behaviour, and sleep¹

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Abstract: The Canadian Society for Exercise Physiology assembled a Consensus Panel representing national organizations, content experts, methodologists, stakeholders, and end-users and followed an established guideline development procedure to create the *Canadian 24-Hour Movement Guidelines for Adults aged 18–64 years and Adults aged 65 years or older: An Integration of Physical Activity, Sedentary Behaviour, and Sleep*. These guidelines underscore the importance of movement behaviours across the whole 24-h day. The development process followed the strategy outlined in the Appraisal of Guidelines for Research and Evaluation (AGREE) II instrument. A large body of evidence was used to inform the guidelines including 2 de novo systematic reviews and 4 overviews of reviews examining the relationships among movement behaviours (physical activity, sedentary behaviour, sleep, and all behaviours together) and several health outcomes. Draft guideline recommendations were discussed at a 4-day in-person Consensus Panel meeting. Feedback from stakeholders was obtained by survey ($n = 877$) and the draft guidelines were revised accordingly. The final guidelines provide evidence-based recommendations for a healthy day (24-h), comprising a combination of sleep, sedentary behaviours, and light-intensity and moderate-to-vigorous-intensity physical activity. Dissemination and

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implementation efforts with corresponding evaluation plans are in place to help ensure that guideline awareness and use are optimized.

Novelty

- First ever 24-Hour Movement Guidelines for Adults aged 18–64 years and Adults aged 65 years or older with consideration of a balanced approach to physical activity, sedentary behaviour, and sleep
- Finalizes the suite of 24-Hour Movement Guidelines for Canadians across the lifespan

Key words: guideline development, public health recommendations, knowledge translation, exercise, movement behaviour.

Résumé : La Société canadienne de physiologie de l'exercice a réuni un panel d'experts représentant des organisations nationales, des experts de contenu, des spécialistes de la méthodologie, des intervenants et des utilisateurs finaux et la SCPE a suivi une procédure d'élaboration de directives pour créer les *Directives canadiennes en matière de mouvement sur 24 heures pour les adultes de 18 à 64 ans et les adultes âgés de 65 ans ou plus : une approche intégrée regroupant l'activité physique, le comportement sédentaire et le sommeil*. Ces directives soulignent l'importance des comportements en matière de mouvement tout au long de la journée de 24 heures. Le processus de développement utilise la stratégie décrite dans l'instrument AGREE II (*Appraisal of Guidelines for Research and Evaluation*). Un grand nombre de données probantes est utilisé pour préciser les directives, y compris deux revues systématiques *de novo* et quatre abrégés de revues examinant les relations entre les comportements en matière de mouvement (activité physique, comportement sédentaire, sommeil, l'ensemble de tous les comportements) et plusieurs résultats cliniques. Les recommandations préliminaires des directives sont discutées pendant 4 jours lors d'une réunion en personne du panel des experts. Les commentaires des intervenants sont obtenus par sondage ($n = 877$) et le projet des directives est révisé en conséquence. Les directives finales fournissent des recommandations fondées sur des données probantes pour une journée en santé (24 heures) comprenant une combinaison de sommeil, de comportements sédentaires, d'activité physique d'intensité légère et d'intensité modérée à vigoureuse. Des efforts de diffusion et de mise en œuvre avec des plans d'évaluation correspondants sont en place pour s'assurer de l'optimisation de la connaissance et de l'utilisation des directives. [Traduit par la Rédaction]

Les nouveautés

- Les toutes premières directives sur les comportements de mouvement sur 24 heures pour les adultes âgés de 18 à 64 ans et les adultes de 65 ans ou plus en tenant compte d'une approche équilibrée de l'activité physique, du comportement sédentaire et du sommeil
- Ce document finalise l'ensemble des directives sur les comportements de mouvement sur 24 heures pour les Canadiennes et les Canadiens tout au long de la vie

Mots-clés : élaboration de directives, recommandations de santé publique, application des connaissances, exercice, comportement de mouvement.

Introduction

There is unequivocal evidence that sleep (Yin et al. 2017), sedentary behaviour (Biswas et al. 2015), and moderate-to-vigorous-intensity physical activity (MVPA; 2018 Physical Activity Guidelines Advisory Committee 2018) are associated with morbidity and mortality in adults independent of age and biological sex. More recently, light-intensity physical activity (LPA) consistent with activities of daily living has also been shown to have a positive effect on health outcomes in a dose-dependent manner (Chastin et al. 2019; Ekelund et al. 2019). Because a change in the amount of time spent in any one of these movement-related behaviours that comprise a 24-h day will change the amount of time spent in another, emerging research has considered how they may interact to influence health outcomes. Indeed, studies that have investigated the combined effect of 24-h movement behaviours on health have clearly shown that the whole 24-h time-use is associated with health outcomes across the lifespan (McGregor et al. 2018, 2019) and have underscored the importance of movement behaviours across the whole day (24-h period).

Canada has an established track record in the development of 24-h movement guidelines having previously released guidelines for Children and Youth (aged 5 to 17 years) in 2016 (Tremblay et al. 2016) and for the Early Years (aged 0–4 years) in 2017 (Tremblay et al. 2017b). Following Canada's lead, several jurisdictions including Australia (Okely et al. 2017), New Zealand (Ministry of Health 2017), South Africa (Draper et al. 2020), and the World Health Organization (2019) have since released 24-h movement guidelines for the early years and/or children and youth, embracing the concept that the mixture of movement behaviours across the whole day is important when health enhancement is the desired objective (Tremblay 2020).

The objective of this report is to describe the process that was used to develop the Canadian 24-Hour Movement Guidelines for Adults aged 18–64 years and for Adults 65 years or older, thereby completing the family of 24-Hour Movement Guidelines for Canadians, and becoming a world first. In contrast to the focus on a single movement behaviour that typifies physical activity guidelines for adults worldwide, the purpose of the evidence-informed 24-Hour Movement Guidelines presented here is to recognize the importance of integrating all movement behaviours and thus, provide more movement options for Canadians and more prevention and treatment options for practitioners.

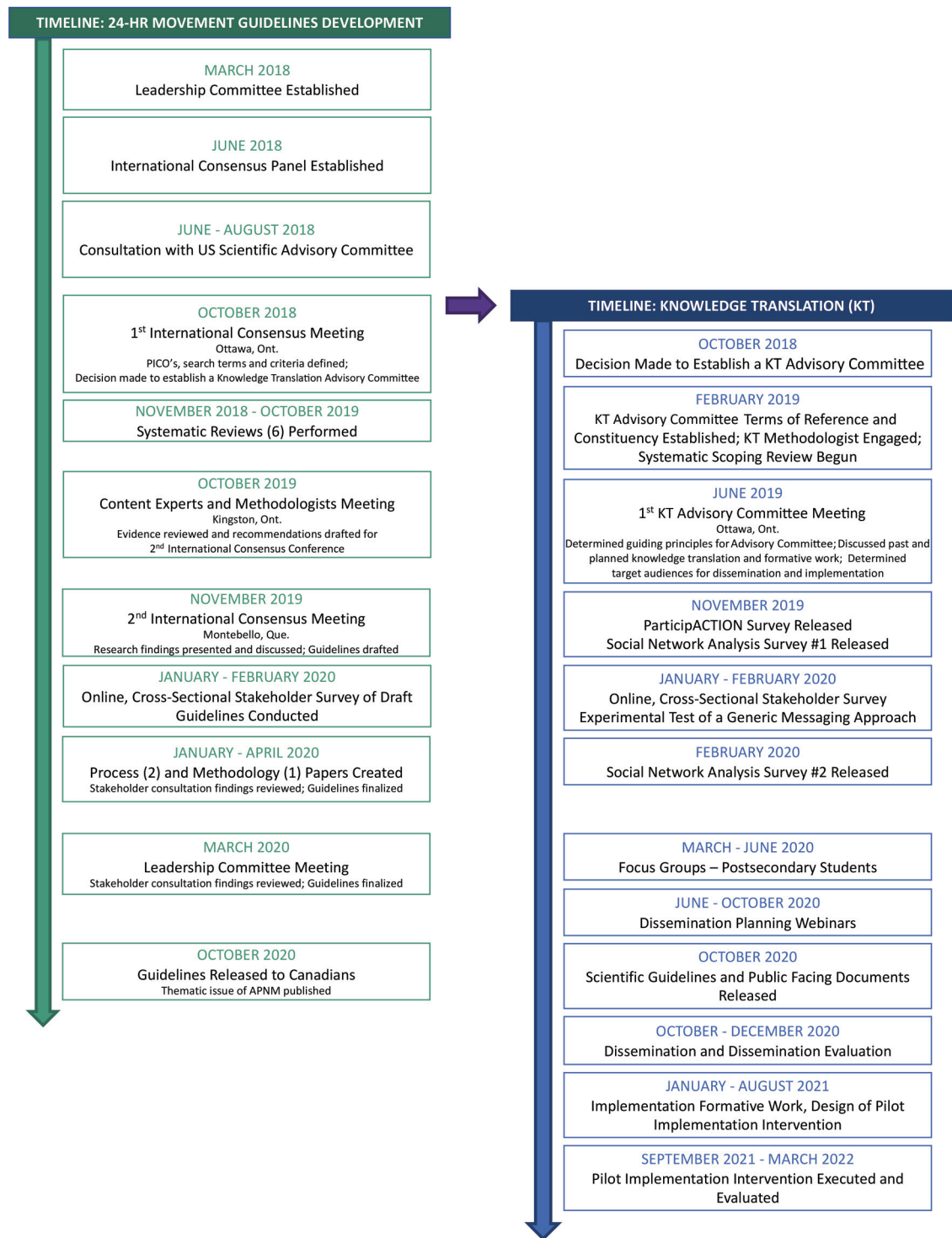
Materials and methods

Guideline development structure

The framework used to develop the guidelines is detailed by Tremblay and Haskell (2012) and summarized in Fig. 1. This framework is consistent with that used to develop the 2 previous Canadian 24-Hour Movement Guidelines for the Early Years (Tremblay et al. 2017b) and Children and Youth (Tremblay et al. 2016). The development process was informed by the Appraisal of Guidelines for Research and Evaluation (AGREE) II instrument (Brouwers et al. 2016), the engagement of guideline development methodologists, and experience gained from earlier guideline development, dissemination, and implementation efforts.

The process started with the hiring of a Project Coordinator and establishment of a Leadership Committee composed of content experts, methodologists, and representatives from each of the funding partners (Public Health Agency of Canada (PHAC)), Canadian Society for Exercise Physiology (CSEP), Queen's University, and ParticipACTION). This Committee, formed in March 2018, met regularly to provide oversight and strategic direction. A subgroup

Fig. 1. Timelines and sequence of events involved in the development of the *Canadian 24-Hour Movement Guidelines for Adults aged 18–64 years and Adults aged 65 years or older: An Integration of Physical Activity, Sedentary Behaviour, and Sleep*. KT, knowledge translation; PICO, Population, Intervention, Comparator, Outcomes.



of the Leadership Committee, the Content Working Group, which included the content and methodology experts, was formed to provide additional opportunities to concentrate on the myriad of details required to generate the systematic reviews for each behaviour. In June 2018, the Leadership Committee formed the broader guideline development Consensus Panel (CP), composed of experts from all relevant disciplines, stakeholders and end users,

international collaborators, and members of the target population (Table 1).

The CP first met in October 2018 for 3 days in Ottawa, Ontario, Canada. The objectives of this initial meeting were to provide an overview of the guideline development process, responsibilities, and timelines; introduce the methodology consultants and explain their responsibilities; and learn from international

Table 1. Guideline Consensus Panel.

Panel member	Affiliation	Role	Conflict of interest declaration*
Content experts			
Julie Carrier, PhD	Professor, Department of Psychology, Université de Montréal; Scientific Director, Canadian Sleep and Circadian Network (Canada)	Sleep content expert, KT Advisory Committee, systematic review author	Dr. Carrier reports grants from Canopy Growth, grants from Rana, grants from Philipps/Respironics, grants from Merck, grants from Eisai, outside the submitted work
Valerie Carson, PhD	Associate Professor, Faculty of Kinesiology, Sport, and Recreation, University of Alberta (Canada)	Combined movement behaviour content expert, Surveillance Subcommittee, systematic review author	None
Jean-Philippe Chaput, PhD	Research Scientist, HALO, CHEO RI; Associate Professor, Department of Pediatrics, Faculty of Medicine, University of Ottawa (Canada)	Sleep content expert, Leadership Committee, Working Content Group, Surveillance Subcommittee, systematic review author	None
Guy Faulkner, PhD	Professor, School of Kinesiology, Faculty of Education, University of British Columbia; Chair in Applied Public Health (Canada)	KT content expert, KT Steering Committee, KT Advisory Committee, systematic scoping review author	None
Lora M. Giangregorio, PhD	Professor, Department of Kinesiology, University of Waterloo; Schlegel Research Chair in Mobility and Aging (Canada)	PA content expert, Leadership Committee, Working Content Group, systematic review author	None
Genevieve N. Healy, PhD	Associate Professor, School of Public Health, Faculty of Medicine, The University of Queensland (Australia)	SB content expert, systematic review author	None
Ian Janssen, PhD	Professor, School of Kinesiology and Health Studies, Queen's University; Canada Research Chair in Physical Activity and Obesity (Canada)	Combined movement behaviour content expert, Leadership Committee, Working Content Group, Surveillance Subcommittee, systematic review author	None
Amy E. Latimer-Cheung, PhD	Associate Professor, School of Kinesiology and Health Studies, Queen's University; Tier 2 Canada Research Chair (Canada)	KT content expert, KT Steering Committee, KT Advisory Committee, systematic scoping review author	None
Ryan Rhodes, PhD	Professor, School of Exercise Science, Physical and Health Education, Department of Psychology (cross-appointed), University of Victoria; Associate Director of the Institute on Aging and Lifelong Health (Canada)	Behaviour content expert	None
Robert Ross, PhD	Professor, School of Kinesiology and Health Studies, Queen's University (Canada)	Chair, Leadership Committee, Working Content Group, KT Advisory Committee, systematic review author	Dr. Ross reports receiving grants from CIHR
Travis J. Saunders, PhD	Associate Professor, Department of Applied Human Sciences, University of Prince Edward Island (Canada)	SB content expert, Leadership Committee, Working Content Group, systematic review author	Dr. Saunders reports receiving grants from Public Health Agency of Canada during the conduct of the study; personal fees from Public Health Agency of Canada and the PEI Public Schools Branch. He has also received conference funding from Ergotron outside of the submitted work
Jennifer R. Tomasone, PhD	Assistant Professor, School of Kinesiology and Health Studies, Queen's University (Canada)	KT content expert, Leadership Committee, Working Content Group, KT Steering Committee, KT Advisory Committee, systematic scoping review author	None

Table 1 (continued).

Panel member	Affiliation	Role	Conflict of interest declaration*
Mark S. Tremblay, PhD	Director, HALO, CHEO RI; Full Professor, Department of Pediatrics, Faculty of Medicine, University of Ottawa (Canada)	Senior Consultant, Leadership Committee, Working Content Group, Surveillance Subcommittee, systematic review author	Dr. Tremblay reports leading similar guidelines for Canada for the Early Years (0–4 years) and Children and Youth (5–17 years) for the CSEP, outside of the submitted work
Stakeholder groups and knowledge users			
Tala Chulak-Bozzer, MSc	Knowledge Manager, ParticipACTION (Canada)	ParticipACTION Representative, Leadership Committee	None
Mary Duggan, CAE	Manager, CSEP (Canada)	CSEP Representative, Leadership Committee, KT Steering Committee, KT Advisory Committee	Ms. Duggan reports grants from the Public Health Agency of Canada to CSEP
Mary Kate Gazendam, MD	Physician, Amherstview Family Health Organization; Board Chair, Loyalist Family Health Team (Canada)	Stakeholder (family physician)	None
William Kennedy	Retired (Canada)	Stakeholder (adults and older adults), KT Advisory Committee	None
Kirstin Lane, PhD	Board Representative, CSEP (Canada); Assistant Teaching Professor, Exercise Science, Physical and Health Education, University of Victoria (Canada)	CSEP Board Representative, Leadership Committee, KT Steering Committee, KT Advisory Committee	None
Amanda Lorbergs, PhD	Manager of Research and Knowledge Translation, Canadian Frailty Network (Canada)	Stakeholder (Canadian Frailty Network), KT Advisory Committee	None
Kaleigh Maclaren	Senior Communications Manager, CSEP (Canada)	CSEP Representative, KT Advisory Committee	Ms. Maclaren reports receiving grants from the Public Health Agency of Canada to CSEP
Sharon Marr, MD	Division Director and Associate Professor, Division of Geriatric Medicine, Department of Medicine, McMaster University (Canada)	Stakeholder (geriatric physician)	Dr. Marr reports receiving grants from CIHR, the Centre for Aging and Brain Health Innovation, the Physicians' Services Incorporated Foundation, and the Provincial Geriatrics Leadership Office, outside of the submitted work
Karen Roberts, MSc	Senior Epidemiologist, Public Health Agency of Canada (Canada)	Public Health Agency of Canada Representative, Leadership Committee, Surveillance Subcommittee	None
Frank Welsh, PhD	Director of Policy, Canadian Public Health Association (Canada)	Stakeholder (Canadian Public Health Association), KT Advisory Committee	None
Juana Willumsen, PhD	Technical Officer, Physical Activity, Department of Health Promotion, World Health Organization (Switzerland)	Stakeholder (World Health Organization)	None
International consultants			
Sebastien Chastin, PhD	Professor, Ghent University (Belgium); Reader, Glasgow Caledonian University (United Kingdom)	Combined movement behaviours content expert, systematic review author	None
Peter T. Katzmarzyk, PhD	Professor and Associate Executive Director for Population and Public Health Sciences; Marie Edana Corcoran Endowed Chair in Pediatric Obesity and Diabetes, Pennington Biomedical Research Center (USA)	PA and SB content expert	None
Kenneth E. Powell, MD, MPH	Retired (USA)	PA and SB content expert	None

Table 1 (concluded).

Panel member	Affiliation	Role	Conflict of interest declaration*
Methodology consultants			
Michelle Kho, PT, PhD	Associate Professor, School of Rehabilitation Science, McMaster University; Tier 2 Canada Research Chair in Critical Care Rehabilitation and Knowledge Translation (Canada)	AGREE II and GRADE Methodological Consultant, Leadership Committee, Working Content Group, systematic review author	Dr. Kho reports receiving personal fees from CSEP; Canada Research Chairs Grants, outside of the submitted work
Veronica J. Poitras, PhD	Independent Researcher (Canada)	AGREE II and GRADE Methodological Consultant, Leadership Committee, Working Content Group, systematic review author	Dr. Poitras reports receiving personal fees from CSEP, and is a CADTH employee
Amanda Ross-White, MLIS	Clinical Outreach Services Librarian, Queen's University (Canada)	Reference Librarian, systematic review author	Mrs. Ross-White reports receiving personal fees from CSEP; personal fees from ProQuest LLC, outside of the submitted work

Note: AGREE, Appraisal of Guidelines for Research Evaluation; CADTH, Canadian Agency for Drugs and Technologies in Health; CAE, Certified Association Executive; CHEO RI, Children's Hospital of Eastern Ontario Research Institute; CIHR, Canadian Institutes of Health Research; CSEP, Canadian Society for Exercise Physiology; GRADE, Grading of Recommendations Assessment, Development, and Evaluation; HALO, Healthy Active Living and Obesity Research Group; KT, Knowledge Translation; MLIS, Master of Library and Information Science; MPH, Master of Public Health; PA, physical activity; PEI, Prince Edward Island; SB, sedentary behaviour.

*Conflict of interest declaration for each member was received in writing at the second Consensus Panel meeting in November 2019. If required, each member revised their initial declaration during their review of this manuscript.

delegates about their guideline processes and the potential of leveraging relevant work to reduce research waste. In addition, for each behaviour (sleep, sedentary, physical activity, and the integration of all of these behaviours), the respective content expert proposed a set of research questions for group discussion. A total of 7 research questions, 2 each for sleep, sedentary behaviour, physical activity, and 1 for the composition of movement behaviours were determined by consensus. For all research questions, the CP reached agreement on the target population, intervention/exposure, and comparator. The CP also identified and prioritized the "critical" (i.e., essential for decision-making) and "important" outcomes for each research question, and reached consensus regarding the final set of outcomes (summarized in Table 2).

Knowledge translation (KT): dissemination and implementation

Initial discussions regarding the importance of KT, dissemination, and implementation at the first CP meeting resulted in the decision to establish a KT process that would operate in parallel with the guideline development process. Details of the KT process and the constituency of those involved are described in detail elsewhere (Tomasone et al. 2020a). In brief, an integrated KT (Canadian Institutes of Health Research (CIHR) 2016) process was undertaken to collaboratively engage relevant organizations, stakeholders, researchers, and end-users in a KT Advisory Committee to guide all stages of guideline KT efforts. Following the formation of a governance structure and terms of reference for the KT Advisory Committee, the group established the focus of the KT efforts, engaged in formative research to inform dissemination and implementation efforts (including a systematic scoping review examining dissemination and implementation strategies used for national movement guidelines; Tomasone et al. 2020b), established and enacted a guideline dissemination and implementation plan, and structured an evaluation to assess the impact of the KT efforts on Canadians' awareness and knowledge of the guidelines, as well as intentions and behaviours commensurate with the guidelines. Key timelines and events in the KT process are summarized in Fig. 1.

Systematic reviews and other evidence to inform the guidelines

Leveraging evidence from the US 2018 Physical Activity Guidelines Scientific Report

At the first CP meeting the members were informed of the recently released [2018 Physical Activity Guidelines Advisory Committee Scientific Report](#) in the United States (herein called the "US Scientific Report") wherein the findings from 38 rigorously performed systematic reviews were presented describing the associations between physical activity, sedentary behaviour, and numerous health outcomes (2018 Physical Activity Guidelines Advisory Committee 2018; Torres et al. 2018). A Chairperson of the Scientific Advisory Committee (Dr. Kenneth E. Powell) accepted an invitation to be a member of the CP and to provide a summary of the methods followed and the results observed at this meeting. Dr. Powell conveyed that the literature review team used a methodology informed by best practice for systematic reviews developed by several federal agencies to review, evaluate, and synthesize published, peer-reviewed physical activity research. The protocol-driven methodology was designed to

maximize transparency, minimize bias, and ensure the systematic reviews were relevant, timely, and of high quality. Quality control processes were implemented throughout the systematic review process to ensure transparency, integrity, reproducibility, and research excellence in design, implementation, and synthesis of the systematic reviews

(Torres et al. 2018).

Following discussion, the CP agreed that the US Scientific Report provided an accurate and comprehensive synthesis of existing evidence regarding the relationships between most aspects of physical activity and health outcomes. Consequently, there was unanimous agreement to leverage the US Scientific Report as the foundational evidence informing the MVPA component of the Canadian guidelines. Based on this decision, the CP also agreed to conduct additional systematic reviews to address gaps in the US Scientific Report. Gaps identified included systematic reviews to consider relationships between LPA, standing, resistance exercise, balance exercise, acute exercise, and exercise frequency of

Table 2. Summary of research questions for the 24-Hour Movement Guideline systematic reviews and overviews of reviews.

Movement behaviour	Strength and resistance training (El-Kotob et al. 2020)	Balance and functional training (McLaughlin et al. 2020)	SB* (Saunders et al. 2020)	Sleep duration (Chaput et al. 2020a)	Sleep timing and consistency (Chaput et al. 2020b)	Integrated (Janssen et al. 2020)
Type of review	Overview of reviews	Overview of reviews	Overview of reviews	Overview of reviews	Systematic review of primary studies	Systematic review of primary studies
Research question	What is the relationship between participation in resistance training and health in adults?	What is the relationship between balance and functional training and health in adults?	What is the relationship between different modes of SB and health in adults?	What is the relationship between patterns of sedentary time (bouts, breaks, frequency, duration, timing) and health indicators in adults?	What are the relationships between sleep timing, sleep consistency, and health in adults?	Is the composition of time spent in sleep, SB, LPA, and MVPA associated with health in adults?
Population	Inclusion: Community-dwelling adults aged 18 y and older, including apparently healthy adults. Eligible studies could include adults with a chronic condition (e.g., heart disease, diabetes, and cancer), adults with obesity, metabolic syndrome, or those who had ≥ 1 fall(s) in the past year among their participant pool Exclusion: Populations comprising pregnant women, residents in long-term care, patients in acute care or a hospital setting, people who were unable to move under their own power, and specialized populations (i.e., elite athletes, disease-specific conditions (e.g., heart disease, diabetes, or cancer, etc., at baseline))†					
Intervention or exposure	Resistance training: contracting the muscles against a resistance (external force) to “overload” and bring about a training effect in the muscular system‡	Gait training (walking technique, pace, level, and direction), balance training (involving challenges to the vestibular system, such as transfer of body weight from one part of the body to another), and functional training (functional activities based on task specificity)§	Self-reported or objectively measured SB (any waking behaviour characterized by an energy expenditure ≤ 1.5 METs, while in a sitting, reclining, or lying posture	Patterns of SB (e.g., bouts, breaks, frequency, duration, and timing)	Sleep timing and sleep consistency (reported separately) using objective or subjective measures (or both)	Composition of time spent in sleep, SB, LPA, and MVPA
Comparison (if any)	1. No intervention or placebo 2. Different doses (i.e., frequency, intensity, time) or types of resistance training programs (e.g., free weight programs, body-weight exercises, power training, isometric training)	1. No intervention or placebo 2. Different doses (e.g., frequency, intensity, time) or types of balance and functional training interventions	Other volumes/durations of SB were used for comparison. However, a comparator or control group was not required for inclusion	Various levels of sleep duration were used for comparison. However, a comparator or control group was not required for inclusion	Various levels of sleep timing or consistency were used for comparison. However, a comparator or control group was not required for inclusion	1. Different compositions of time spent in sleep, SB, LPA, and MVPA 2. Changes to the composition of time spent in sleep, SB, LPA, and MVPA
Outcomes (critical)	Function and disability, health-related quality of life, mortality, nonserious adverse events, serious adverse events	Fall-related injuries or falls, nonserious adverse events, serious adverse events	Brain health, cognitive function, health-related quality of life, mental health	Accidents/injuries, biomarkers of cardiometabolic risk, body composition, brain health, cognitive function, fall-related injuries or falls, health-related quality of life, mental health, musculoskeletal pain	Brain health, cognitive function, falls and accidents/injuries, incident cardiovascular disease, incident type 2 diabetes, mental health, mortality	Accidents/injuries, biomarkers of cardiometabolic risk, body composition, brain health, cognitive function, fall-related injuries or falls, health-related quality of life, incident cardiovascular disease, incident type 2 diabetes, mental health, musculoskeletal pain, nonserious and serious adverse events
Eligible primary study designs	Systematic reviews with or without meta-analyses	Systematic reviews with or without meta-analyses	Systematic reviews with or without meta-analyses	Systematic reviews including randomized and nonrandomized primary intervention studies	Peer-reviewed primary studies were included (e.g., observational and experimental trials)	Peer-reviewed primary studies were included (e.g., observational and experimental trials)

Table 2 (continued).

Movement behaviour	Strength and resistance training (El-Kotob et al. 2020)	Balance and functional training (McLaughlin et al. 2020)	SB* (Saunders et al. 2020)	Sleep duration (Chaput et al. 2020a)	Sleep timing and consistency (Chaput et al. 2020b)	Integrated (Janssen et al. 2020)
Search databases	MEDLINE, EMBASE, PsycINFO using the Ovid interface, and CINAHL	PsycINFO using the Ovid interface, and CINAHL	using the EBSCO platform			MEDLINE, EMBASE, PsycINFO, CINAHL, and SPORTDiscus
Search dates	Searches were conducted in February 2019 and we searched for the previous 10 y (February 2009) and we rerun searches in May 2019	Searches were conducted in May 2019, and we searched for the previous 10 y (May 2009). We reran searches in November 2019	Searches were conducted the week of 25 February 2019 and we searched for the previous 10 y (from 25 February 2009) and we rerun searches on 13 May 2019	Searches were conducted the week of 18 December 2018 and we searched for the previous 10 y (from 18 December 2008 until 18 December 2018)	Searches were conducted the week of 18 December 2018 and we searched for the previous 10 y (from 18 December 2008 until 18 December 2018)	Searches were conducted the week of 16 August 2019 and dated back to 2015, the date of the first compositional analysis study in the movement behaviour field
Registration no. (PROSPERO)	CRD42019121641	CRD42019134865	CRD42019123121	CRD42019127157	CRD42019119534	TBC

Note: LPA, light physical activity; METs, metabolic equivalents; MVPA, moderate-to-vigorous physical activity; ProFaNE, Prevention of Falls Network Europe; SB, sedentary behaviour.

*SB review questions reported in 1 manuscript.

[†]Please see individual papers for more detail.

[‡]According to the ProFaNE taxonomy, resistance training is defined as “contracting the muscles against a resistance to ‘overload’ and bring about a training effect in the muscular system. The resistance is an external force, which can be one’s own body placed in an unusual relationship to gravity (e.g. prone back extension) or an external resistance (e.g. free weight)” (Lamb et al. 2011).

[§]Gait, balance and functional training or 3D exercise (e.g., Tai Chi or dance) defined according to the ProFaNE taxonomy: “Gait training involves specific correction of walking technique (e.g., posture, stride length and cadence) and changes of pace, level and direction. Balance training involves the efficient transfer of bodyweight from one part of the body to another or challenges specific aspects of the balance system (e.g. vestibular systems). Balance retraining activities range from re-education of basic functional movement patterns to a wide variety of dynamic activities that target more sophisticated aspects of balance. Functional training uses functional activities as the training stimulus and is based on the theoretical concept of task specificity.”

^{||}Tremblay et al. 2017a.

MVPA and health outcomes. Given the resources available to perform additional systematic reviews, the CP suggested that the Leadership Committee convene at a later date and select 2 of the 6 components of physical activity behaviour for which systematic reviews would be performed. Following discussion, the Leadership Committee decided to conduct additional systematic reviews for resistance training and balance and functional training. The Committee acknowledged the growing body of evidence confirming the health benefits of LPA and standing, but decided against performing a systematic review as it was unlikely to yield the evidence required to identify specific durations of either behaviour that would inform the development of the 24-Hour Movement Guidelines.

Consistent with the CP decision to leverage the US Scientific Report to inform the physical activity component of the guidelines, there was unanimous agreement to use the Report as the foundational evidence that identified strong dose–response relationships between sedentary behaviour and incident cardiovascular disease, as well as all-cause and cardiovascular disease mortality, although they found limited evidence of a dose–response gradient between sedentary behaviour and type 2 diabetes, weight status, incident cancer, and cancer-related mortality. The CP also agreed to conduct 2 additional systematic reviews to address gaps in the US Scientific Report related to other critical and important health outcomes (see below).

Systematic reviews

Following discussion related to the leveraging of the US Scientific Report, the CP determined that 6 systematic reviews were required to further inform the development of the 24-h Movement Guidelines. Given that there was a large body of evidence already synthesized in existing systematic reviews for 4 of the research questions (resistance training, balance and functional training, mode and patterns of sedentary behaviour, and sleep duration), overviews of reviews were conducted for these questions and de novo systematic reviews of primary studies were conducted for the remaining 2 research questions (sleep timing and consistency, integrated movement behaviours). A brief overview of all systematic reviews is given in Table 2.

The de novo systematic reviews were conducted using accepted methods (Cook et al. 1997; Higgins and Green 2011). The overviews of reviews were performed as described in a separate report in this special supplement (Kho et al. 2020). In each de novo systematic review, the quality of evidence was rated (from “high” to “very low”) by outcome, study design, and age group (where possible), using the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) framework (Guyatt et al. 2008). In brief, quality ratings begin at “high” for evidence from randomized controlled trials and “low” for evidence from all other study designs. From there, quality ratings are decreased if the contributing studies were poorly designed or executed (serious risk of bias), had inconsistent (unexplained heterogeneity) or imprecise (wide confidence intervals) results, or had evidence of publication bias. Quality ratings are increased if other criteria are met, such as a large magnitude of effect or evidence of a dose–response gradient. For the overview of reviews, the quality of the evidence was extracted and reported as evaluated by the systematic review authors, and the quality of the systematic reviews themselves was assessed using the A MeaSurement Tool to Assess systematic Reviews II (AMSTAR II) criteria (Shea et al. 2017). All reviews were prospectively registered in PROSPERO (<https://www.crd.york.ac.uk/prospéro>) and reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement for reporting systematic reviews and meta-analyses (Liberati et al. 2009). Below, we briefly describe the topic of each of the systematic reviews. The target population, intervention/exposure, comparator(s), critical and important outcomes, and registration ID for each review are given in Table 2.

Resistance training

An overview of systematic reviews was performed to determine the benefits and harms of resistance training on health outcomes in adults (El-Kotob et al. 2020). The overview also explored whether there was evidence that age, exposure dose, or type of resistance training influenced the effects on health outcomes. According to the Prevention of Fall Network Europe (ProFaNE) taxonomy, resistance training was defined as “contracting the muscles against a resistance to ‘overload’ and bring about a training effect in the muscular system”.

Balance and functional training

An overview of systematic reviews was performed to examine the effect of gait, balance, and functional training on health outcomes in adults (McLaughlin et al. 2020). The overview also explored whether there was evidence that age, exposure dose, or type of balance and functional training influenced the relationships with health outcomes. Balance and functional training and 3-dimensional exercise (e.g., Tai Chi, dance, or exergames) were considered in this category, and were defined in accordance with the ProFaNE taxonomy definitions.

Sleep

Two systematic reviews were performed. The first, an overview of systematic reviews, examined the associations between sleep duration and health outcomes in adults (Chaput et al. 2020a). The second sleep systematic review of primary studies examined the associations between sleep timing (e.g., bedtime/wake-up time, midpoint of sleep), sleep consistency/regularity (e.g., intra-individual variability in sleep duration, social jetlag (misalignment of biological and social time), catch-up sleep), and health outcomes in adults (Chaput et al. 2020b).

Sedentary behaviour

A single overview of reviews was performed to answer 2 research questions that considered the impact of patterns of sedentary behaviour on health outcomes in adults (Saunders et al. 2020). The first question considered the relationship between types of sedentary behaviour and health outcomes. The second considered the relationships between patterns of sedentary behaviour and health outcomes.

Integration of all movement behaviours

A single systematic review was conducted to determine if the composition of time spent in sleep, sedentary behaviour, LPA, and MVPA is associated with health in adults (Janssen et al. 2020). This review considered whether the composition of movement behaviours across the full 24-h day was associated with health outcomes and the extent to which reallocating time across movement behaviours was associated with changes in health outcomes.

Drafting of guideline recommendations

A second meeting of the CP was held in Montebello, Quebec, Canada, in November of 2019. The objectives of this 4-day meeting were to review findings from the systematic reviews and overviews of reviews, develop individual movement behaviour guideline recommendations, and create 24-h movement guideline recommendations for both adults aged 18 to 64 and adults 65 years and older along with the respective preambles. In drafting the guideline recommendations, the CP considered the evidence for the possible benefits and harms of various intensity levels of physical activity, sedentary behaviours, and sleep; stakeholder and end-user preferences and values related to these movement behaviours; and considerations related to feasibility, accessibility, resource use, and equity (Alonso-Coello et al. 2016b). For each guideline recommendation, considerable time was taken to present the breadth and quality of the evidence, and to provide time for a full discussion among Panel members to ensure that the wording of each recommendation was thoughtfully considered

and consistent with the evidence. Following completion of a first draft, to provide further opportunity for all Panel members to provide their thoughts and perspectives, the draft guidelines were revisited the next day to ensure that all members had sufficient time to reflect on prior discussions and if required, engage in further discussion to achieve consensus. The draft guideline recommendations that were created at the second CP meeting were then translated into French. Following translation, the guidelines in both languages were sent to the CP members by email for review and comment. All CP members endorsed the draft guidelines.

Stakeholder consultations

An online survey (see Appendix A for the complete survey in English and French) was developed to solicit stakeholder assessment and feedback on (i) the content and wording of the draft guidelines, and (ii) criteria of importance to the AGREE II and GRADE Evidence to Decision (ETD) Framework (i.e., priority, acceptability, feasibility, resource use, cost-benefit ratio, and equity). Stakeholders were any individuals involved with physical activity, sedentary, and/or sleep behaviour in a professional capacity (e.g., policymaker, healthcare provider, public health practitioner, researcher, educator, recreation/sport practitioner). Following approval from Queen's University's Research Ethics Board (GSKHS-329-19), the survey was created online using Qualtrics software and was open from January 23 to February 10, 2020. The survey was disseminated through the various networks of the CP and KT Advisory Committee members (Table 1) and followed a snowball sampling methodology to optimize survey reach. Data were imported into SPSS (version 26 for Mac; IBM Corp., Armonk, N.Y., USA) and Excel (Microsoft Corp., Seattle, Wash., USA) for analysis of closed- and open-ended responses, respectively. Descriptive statistics were calculated to summarize stakeholder demographics and closed-ended feedback. Open-ended questions that addressed AGREE II and GRADE ETD Framework criteria were coded using inductive content analysis to identify key suggestions and/or concerns about the guidelines (Faught et al. 2020). Initial codes were generated from the survey responses by 2 research staff members. Overarching categories were formed from grouping codes, and codes were then reviewed and refined by collapsing, separating, or deleting. Key suggestions/concerns were grouped in hierarchical categories and defined using content-characteristic words. Comments in English and French were analyzed in parallel and combined in the analyses. Frequency counts of each suggestion and/or concern was quantified through summing the total number of responses for each key code.

Revisions to guidelines based on stakeholder feedback

On March 5, 2020, the Leadership Committee and selected members of the KT Advisory Committee met in Ottawa, Ontario, Canada, either in person or by video conference to collectively review the survey results. The stakeholder feedback for all closed and open questions was carefully considered and the draft guidelines were revised accordingly (see Revisions to guidelines based on stakeholder feedback, below).

Surveillance of the guidelines

The release of *Canadian 24-Hour Movement Guidelines for Adults aged 18–64 years and Adults aged 65 years or older* requires a shift from the surveillance and monitoring of individual movement behaviours in isolation to the integrated surveillance of all movement behaviours. A Surveillance Subcommittee, which comprised a subset of the CP with movement behaviour surveillance expertise (Table 1), along with additional members from federal government agencies responsible for health surveillance, was assembled to develop specific surveillance recommendations. The Surveillance Subcommittee communicated via email and teleconferences to develop preliminary recommendations for the monitoring

and surveillance of the new guidelines. This approach was similar to that followed for the surveillance recommendations created for the 24-Hour Movement Guidelines for Children and Youth (Tremblay et al. 2016) and of the Early Years (Tremblay et al. 2017b).

External review

Four independent reviewers were contracted to assess the entire guideline development process using the AGREE II tool (Brouwers et al. 2016). The available materials presented in this special issue of *Applied Physiology, Nutrition, and Metabolism* were provided to the independent assessors.

Results

The guideline development process adhered to the framework outlined by Tremblay and Haskell (2012). Throughout the process, methodologists on the CP and Leadership Committee familiar with AGREE II (Brouwers et al. 2010) and GRADE (Guyatt et al. 2008) provided advice and worked closely with the Project Coordinator to ensure we maintained detailed records of all meetings, discussions, and decisions to help inform the guideline recommendations and the Evidence to Decision Framework (Alonso-Coello et al. 2016b, 2016a). The Leadership Committee and Content Working Group met in person or by teleconference approximately 35 times and many more times by email over the course of the guideline development process. CP meetings were held in Ottawa, Ontario, Canada, in October 2018 and in Montebello, Quebec, Canada, in November 2019. During the entire guideline development process the CP received numerous updates detailing key Leadership Committee decisions with opportunity for feedback and clarification.

Results of systematic reviews and overviews

Resistance training

An overview of reviews was performed to examine the effects of resistance training (RT) on health outcomes (compared with no RT or different types or doses of RT) in adults (El-Kotob et al. 2020). Eleven systematic reviews were included, which contained data from 364 primary studies from 28 countries involving 382 627 unique participants (El-Kotob et al. 2020). Overall, the quality of the evidence was very low. Compared with no RT, RT was associated with a 21% lower risk of all-cause mortality (low-quality evidence; Saeidifard et al. 2019). Regarding the physical function outcome, compared with no RT, RT improved muscle strength in adults and muscle strength and physical functioning in adults over the age of 65 years (moderate-quality evidence; Muñoz-Martínez et al. 2017; Lai et al. 2018). There was no effect of RT on health-related quality of life (very low-quality evidence; El-Kotob et al. 2020). RT was associated with a 23% reduction in incident fatal coronary heart disease and nonfatal myocardial infarction in men (low-quality evidence; Saeidifard et al. 2019). Effects of RT on cognitive function were inconsistent (very low-quality evidence; Raymond et al. 2013). There were no identified reviews examining the effects of RT on the target population for several important health outcomes (incident diabetes, depression, cancer, brain health, bone health, or falls). Adverse events (both serious and nonserious) were not consistently monitored or reported, but in 22 trials where they were reported, the majority were nonserious, and serious adverse events were infrequent (very low-quality evidence; Liu and Latham 2010). The benefits of RT likely outweigh the harms (very low-quality evidence). There was insufficient evidence to support a specific mode, intensity, or duration of RT. While many of the systematic reviews examined were inclusive of adults over 65 years of age, for the majority of outcomes there were insufficient data to determine if age modified the effect of RT on health outcomes (El-Kotob et al. 2020).

Balance and functional training

An overview of reviews was performed to determine the health-related effects of balance and functional training, as well as

3-dimensional physical activities (e.g., Tai Chi, dance, or exergames), on health outcomes in adults (McLaughlin et al. 2020). We did not identify any systematic reviews that examined the effects of balance and functional training on our critical or important outcomes in healthy adults aged 18 to 64 years. In adults 65 years or older, we identified 5 systematic reviews that examined balance and functional training, encompassing data from 77 studies and 15 890 participants in 23 countries. In adults over 65 years of age, balance and functional training reduced the rate of falls or the number of people who fell (high-certainty evidence; synonymous with “high-quality evidence”). There was evidence that balance and functional training may reduce fall-related fractures (low-quality evidence; Sherrington et al. 2019), improve physical function (low-quality evidence), and increase physical activity levels (moderate-quality evidence). Conversely, evidence suggested that balance and functional training may have no effect on health-related quality of life (low-quality evidence). We did not find studies that examined whether age was an effect modifier or that directly compared different types of balance and functional training. Adverse events were not consistently reported; when they were reported they were infrequent, the majority were not serious, and they were of a musculoskeletal nature or transient (moderate-quality evidence).

Sedentary behaviour

We conducted an overview of reviews of the relationship between types and patterns of sedentary behaviour with health outcomes. This overview included 18 systematic reviews and contained data from 245 studies with more than 510 000 unique participants from 32 countries (Saunders et al. 2020). Sedentary behaviour was unfavourably associated with cognitive function, depression, function, and disability, physical activity levels, and some domains of quality of life in adults. There was evidence that reducing or breaking up sedentary behaviour may benefit body composition and markers of cardiometabolic risk. Total sedentary behaviour and TV viewing were most consistently associated with unfavourable health outcomes, while there was evidence that computer and Internet use may lead to benefits in cognitive function for older adults. The overall quality of evidence was very low. There was little evidence that sedentary behaviour is associated with musculoskeletal pain, accidents or injuries, fatigue, sleep, or work productivity.

Sleep

For the sleep duration overview of reviews, 11 systematic reviews were included and contained data from 260 studies and 4 437 101 unique participants from 30 countries (Chaput et al. 2020a). Sleep duration was assessed subjectively in 96% of studies and 78% of studies in the reviews were prospective cohort studies. A U-shaped association was observed between sleep duration and health outcomes. The dose-response curves showed that a sleep duration of around 7–8 h per day was most favourably associated with the health outcomes that were examined, with no apparent modification of the association by age in the few relevant studies. The overall quality of evidence was moderate quality for sleep duration for the critical health outcomes examined.

For the sleep timing and consistency de novo systematic review, a total of 41 articles, including 92 340 unique participants from 14 countries, met the inclusion criteria (Chaput et al. 2020b). Sleep was assessed objectively in 37% of studies and subjectively in 63% of studies. Later sleep timing and greater sleep variability were generally associated with more adverse health outcomes, with no apparent modification of the association by age. However, because most studies reported linear associations, it was not possible to identify thresholds for “late sleep timing” or “large sleep variability”. In addition, social jetlag (misalignment of biological and social time) was associated with more adverse health outcomes, while weekend catch-up sleep was associated with better

health outcomes. Thus, the available evidence indicated that earlier sleep timing and regularity in sleep patterns with consistent bedtimes and wake-up times were favourably associated with health. The overall quality of evidence was rated very low.

Composition of movement behaviours

For the systematic review of original studies that used a compositional data analysis approach to examine the association between the 24-h movement behaviour composition and health outcomes, a total of 8 studies (7 cross-sectional, 1 prospective cohort) of >12 000 unique participants were included (Janssen et al. 2020). The 8 studies that were identified examined 4 critical outcomes (all-cause mortality, adiposity, cardiometabolic biomarkers, mental health). The results were summarized using narrative syntheses structured around each of these health outcomes. Findings indicated that the 24-h movement behaviour composition was associated with all-cause mortality, adiposity, and cardiometabolic biomarkers. The overall pattern of findings when considering all associations for all health outcomes suggested that health would improve if time was reallocated into MVPA and that health would worsen if time was taken out of MVPA, irrespective of what other movement behaviour MVPA was reallocated out of or into. Health would also improve if time were taken out of sedentary behaviour and reallocated into sleep or LPA. The quality of evidence was very low for all health outcomes. These findings support the notion that the intensity of movement across the entire 24-h day matters and that recommendations for sleep, sedentary, and physical activity can be combined into a single public health guideline.

Stakeholder consultations

Stakeholder survey

The draft guidelines developed and approved by consensus at the November 2019 CP meeting were utilized for the online stakeholder survey. The draft guidelines are included as part of the stakeholder survey, which is available in [Appendix A](#).

Demographics

During the two and a half weeks that the online stakeholder survey was open, 877 stakeholders landed on the front page of the survey. The number of responses varied by question with 648 to 839 responses for close-ended questions. There were participants from all Canadian provinces and territories except Nunavut; the greatest proportion were living in Ontario (37.4%), Alberta (15%), British Columbia (12.1%), Québec (6.6%), and Manitoba (5.2%). In addition, 13.3% of stakeholders who responded resided outside of Canada. Stakeholders were encouraged to select any relevant sector(s) with which they associated. The sectors stakeholders most associated with were healthcare (368), public health (294), sport (287), education (287), research (263), and recreation (248). The majority of stakeholders opted to complete the survey in English (94.4%), while 5.6% completed the survey in French.

Content and format of the guidelines

For all sections of the guidelines (i.e., titles, preambles, guidelines) for adults aged 18–64 and 65 years or older, the proportion of stakeholders who strongly agreed or somewhat agreed that the sections were *clearly stated* ranged from 90.6% to 95%. The proportion who strongly agreed or somewhat agreed with *how* these sections were stated ranged from 87.6% to 92.1%. A more complete summary of the stakeholder survey results is provided in [Table 3](#). Among the feedback received via the open-ended questions, the most frequently occurring suggestions or concerns were in relation to the high literacy level of the guidelines (if intended for members of the public), guideline terminology (e.g., title too long, “movement” not applicable to sedentary behaviour and sleep), the target audience was unclear (i.e., healthcare practitioners vs. members of the public), and the Guidelines should only be identified

by the age intervals (i.e., remove the qualifier “older” for the 65 years or older group guideline).

There was high agreement (“strongly agree” or “somewhat agree”) among stakeholders that the Canadian 24-Hour Movement Guidelines for Adults aged 18–64 years and Adults aged 65 years or older are a priority (87.5%). There was also high agreement that using the guidelines would be feasible (83.6%), acceptable (68.3%), useful (73.1%), cost-effective (65.6%), and equitable for all adult Canadians (irrespective of gender, race, ethnicity, or socioeconomic status; 85.4%). Additionally, most (69.9%) indicated that the benefits of using the guidelines are likely to outweigh the costs. Open-ended response options were available for stakeholders who chose to elaborate on their responses to closed-ended items. A majority of stakeholders who provided feedback to these items provided favourable or neutral feedback, with the most common requests for examples or additional KT tools. Notably, 140 of 651 (21.5%) stakeholders expanded on their responses to the equity item. Sixty-eight (10.4%) indicated that they felt that the guidelines do not respect the varying socioeconomic statuses of all adult Canadians.

Revisions to guidelines based on stakeholder feedback

Stakeholder feedback did result in some relatively minor, yet important revisions to the draft guidelines. To avoid the inference of ageism, the qualifier “older” for the 65 years or older age group was removed from the title of the guidelines and throughout the guideline document. Three additional changes were made to the content of both guideline preambles: (i) In response to stakeholder concern that the literacy level may be too high for the general population, both preambles were revised to properly identify the target users of guideline documents: “This document is intended for policy makers, health professionals, and researchers and it may be useful to interested members of the public.” It is relevant to note that separate public-facing documents using accessible language will be created to disseminate the guidelines to the general public. (ii) To address concerns that the guidelines may not respect the variability in socioeconomic status among Canadian adults, a statement was added as follows: “Following these Guidelines may be challenging at times; progressing towards any of the Guideline targets will result in some health benefits.” (iii) A reference to CSEP’s “24-Hour Movement Guidelines: Glossary of Terms” was added as part of the list of tools in the final sentence of the preambles. The glossary serves as a useful tool for defining many of the terms (e.g., sedentary, recreational screen time) that stakeholders indicated may have an unclear meaning in the recommendations.

A single revision was made that clarified the content of the guidelines. Stakeholder feedback suggested that “prolonged sitting” should be quantified within the sedentary behaviour recommendation. In response the word “prolonged” was revised to “long periods of sitting” to improve comprehension while staying true to the underlying science of the recommendation (Saunders et al. 2020).

The revised guidelines were subsequently circulated to the CP for comment and final revisions and unanimous consensus was achieved. Revisions were then translated to revise and finalize the French version. The final guidelines and preamble in both English and French are provided in [Figs. 2–3](#).

GRADE evidence to decision framework: summary

The specific guideline recommendations for the Canadian 24-Hour Movement Guidelines for Adults aged 18 to 64 years and Adults aged 65 years or older are provided here with corresponding statements indicating the overall quality of the evidence that informed the recommendations, and a summary of the key findings for each behaviour that were used to formulate the recommendations and determine the strength of the recommendations. As

Table 3. Summary results of closed-ended stakeholder survey questions.

Question	Strongly agree, n (%)	Somewhat agree, n (%)	Neither agree nor disagree, n (%)	Somewhat disagree, n (%)	Strongly disagree, n (%)	Total responses, n	
The Titles are clearly stated	632 (75.3)	163 (19.4)	15 (1.8)	26 (3.1)	3 (0.4)	839	
I ____ with how the Titles are stated	500 (68.4)	154 (21.1)	36 (4.9)	37 (5.1)	4 (0.5)	731	
The Preambles are clearly stated	456 (61.6)	223 (30.1)	20 (2.7)	36 (4.9)	5 (0.7)	740	
I ____ with how the Preambles are stated	391 (52.5)	264 (35.4)	37 (5.0)	45 (6.0)	8 (1.1)	745	
I would use the Preambles	369 (50.2)	245 (33.3)	70 (9.5)	41 (5.6)	10 (1.4)	735	
The physical activity recommendations are clearly stated	429 (60.9)	214 (30.4)	20 (2.8)	32 (4.5)	10 (1.4)	705	
I ____ with how the physical activity recommendations are stated	377 (53.6)	239 (34.0)	23 (3.3)	52 (7.4)	12 (1.7)	703	
The sedentary behaviour recommendations are clearly stated	466 (66.7)	167 (23.9)	25 (3.6)	31 (4.4)	10 (1.4)	699	
I ____ with how the sedentary behaviour recommendations are stated	417 (59.7)	201 (28.8)	30 (4.3)	37 (5.3)	13 (1.9)	698	
The sleep recommendations are clearly stated	544 (78.3)	116 (16.7)	18 (2.6)	15 (2.1)	2 (0.3)	695	
I ____ with how the sleep recommendations are stated	492 (70.9)	147 (21.2)	28 (4.0)	23 (3.3)	4 (0.6)	694	
The integrated recommendations are clearly stated	492 (71.1)	150 (21.7)	26 (3.8)	10 (2.7)	5 (0.7)	683	
I ____ with how the integrated recommendations are stated	468 (67.7)	164 (23.7)	29 (4.3)	25 (3.6)	5 (0.7)	691	
Question	Very important, n (%)	Important, n (%)	Moderately important, n (%)	Slightly important, n (%)	Not at all important, n (%)	Total responses, n	
How important are the 24 HMG to you in your professional work? (priority)	420 (62.3)	170 (25.2)	50 (7.4)	25 (3.7)	9 (1.4)	674	
Question	Very relevant, n (%)	Relevant, n (%)	Moderately relevant, n (%)	Slightly relevant, n (%)	Not at all relevant, n (%)	Total responses, n	
How relevant are the 24 HMG to the populations you work with? (priority)	442 (65.8)	148 (22.0)	52 (7.7)	18 (2.7)	12 (1.8)	672	
Question	Always, n (%)	Frequently, n (%)	Occasionally, n (%)	Seldom, n (%)	Rarely, n (%)	Never, n (%)	Total responses, n
How often would you use the 24 HMG in your professional work? (acceptability)	126 (18.7)	334 (49.6)	157 (23.3)	45 (6.7)	1 (0.2)	10 (1.5)	673
Question	Very easy, n (%)	Somewhat easy, n (%)	Neither easy nor difficult, n (%)	Somewhat difficult, n (%)	Very difficult, n (%)	Total responses, n	
How easy or difficult would you find using the 24 HMG? (feasibility)	316 (47.0)	246 (36.6)	63 (9.4)	35 (5.2)	12 (1.8)	672	
Question	Much more useful, n (%)	More useful, n (%)	Neutral, n (%)	Less useful, n (%)	Much less useful, n (%)	Total responses, n	
In comparison to separate movement behaviour guidelines, the integrated 24HMG are how useful? (acceptability)	193 (28.9)	295 (44.2)	163 (24.4)	13 (1.9)	4 (0.6)	668	
Question	Strongly agree, n (%)	Somewhat agree, n (%)	Neither agree nor disagree, n (%)	Somewhat disagree, n (%)	Strongly disagree, n (%)	I don't know, n (%)	Total responses, n
The costs for you or your organization to implement the 24 HMG are likely to be small or negligible compared to not using the Guidelines. (resource use)	282 (43.3)	145 (22.3)	85 (13.1)	10 (1.5)	8 (1.2)	118 (18.6)	648
The benefits of using the 24 HMG are likely to outweigh the costs (e.g., time, financial, opportunity, etc.) in your professional work. (perceived incremental cost-benefit ratio)	303 (46.5)	152 (23.4)	105 (16.2)	15 (2.3)	7 (1.1)	69 (10.5)	651
Following the 24 HMG is likely to benefit adult and older adult Canadians irrespective of gender, race, ethnicity, or socioeconomic status. (equity)	404 (62.1)	152 (23.3)	39 (6.0)	29 (4.5)	12 (1.8)	15 (2.3)	651

Note: 24 HMG, 24-Hour Movement Guidelines.

Fig. 2. Canadian 24-Hour Movement Guidelines for Adults aged 18–64 years.

18–64 years

CANADIAN 24-HOUR MOVEMENT GUIDELINES

FOR ADULTS AGED 18–64 YEARS:

An Integration of Physical Activity, Sedentary Behaviour, and Sleep

PREAMBLE

This document is intended for use by policy makers, health professionals, and researchers, and it may be useful to interested members of the public.

These 24-Hour Movement Guidelines are relevant to adults (aged 18–64 years), irrespective of gender, cultural background, or socio-economic status. These Guidelines may not be appropriate for adults aged 18–64 years who are pregnant or persons living with a disability or a medical condition; these individuals should consider consulting the *Get Active Questionnaire*, disability/condition-specific recommendations, or a health professional for guidance.

Adults aged 18–64 years should participate in a range of physical activities (e.g., weight bearing/non-weight bearing, sport and recreation) in a variety of environments (e.g., home/work/community; indoors/outdoors; land/water) and contexts (e.g., leisure, transportation, occupation, household) across all seasons. Adults aged 18–64 years should limit long periods of sedentary behaviours and should practice healthy sleep hygiene (routines, behaviours, and environments conducive to sleeping well).

Following the 24-Hour Movement Guidelines is associated with these health benefits:

- a lower risk of mortality, cardiovascular disease, hypertension, type 2 diabetes, several cancers, anxiety, depression, dementia, weight gain, adverse blood lipid profile; and
- improved bone health, cognition, quality of life and physical function.

The benefits of following these Guidelines far exceed potential harms. Following these Guidelines may be challenging at times; progressing towards any of the Guideline targets will result in some health benefits.

These 24-Hour Movement Guidelines were informed by the best available evidence, expert consensus, stakeholder consultation, and consideration of values and preferences, applicability, feasibility, and equity. A glossary and more details on the Guidelines, the background research, their interpretation, guidance on how to achieve them, and recommendations for further research and surveillance are available at <https://csep.ca/guidelines>.



described earlier, the quality of evidence statements was derived following the objective criteria outlined within the GRADE framework. More information on the factors used to evaluate the quality of evidence is available elsewhere (Guyatt et al. 2008).

For adults aged 18 to 64 years a healthy 24-h day includes

- Moderate to vigorous aerobic physical activities such that there is an accumulation of at least 150 min per week. *Strong recommendation, moderate quality evidence.*

Fig. 2 (continued).

CANADIAN 24-HOUR MOVEMENT GUIDELINES FOR ADULTS (AGED 18-64 YEARS)

For health benefits, adults aged 18-64 years should be physically active each day, minimize sedentary behaviour, and achieve sufficient sleep.

A healthy 24 hours includes:

PHYSICAL ACTIVITY

Performing a variety of types and intensities of physical activity, which includes:



- **Moderate to vigorous aerobic physical activities** such that there is an accumulation of at least 150 minutes per week

- Muscle strengthening activities using major muscle groups at least twice a week



- Several hours of **light physical activities**, including standing

SLEEP



Getting 7 to 9 hours of good-quality sleep on a regular basis, with consistent bed and wake-up times

SEDENTARY BEHAVIOUR



Limiting sedentary time to 8 hours or less, which includes:

- No more than 3 hours of recreational screen time
- Breaking up long periods of sitting as often as possible



Replacing sedentary behaviour with additional physical activity and trading light physical activity for more moderate to vigorous physical activity, while preserving sufficient sleep, can provide greater health benefits.



Progressing towards any of these targets will result in some health benefits.



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- Muscle strengthening activities using major muscle groups at least twice a week. *Strong recommendation, very low-quality evidence.*
- Several hours of light physical activities, including standing. *Strong recommendation, low-quality evidence.*
- Limiting sedentary time to 8 h or less, which includes no more than 3 h of recreational screen time and breaking up long periods of sitting as often as possible. *Strong recommendation, very low-quality evidence.*
- Getting 7 to 9 h of good-quality sleep on a regular basis, with consistent bed and wake-up times. *Strong recommendation, moderate- (sleep duration) and very low- (sleep consistency) quality evidence.*

- Replacing sedentary behaviour with additional physical activity and trading light physical activity for more moderate to vigorous physical activity, while preserving sufficient sleep, can provide greater health benefits. *Strong recommendation, very low-quality evidence.*

For adults 65 years or older a healthy 24-h day includes

- Moderate to vigorous aerobic physical activities such that there is an accumulation of at least 150 min per week. *Strong recommendation, low-quality evidence.*
- Muscle strengthening activities using major muscle groups at least twice a week. *Strong recommendation, very low-quality evidence.*

Fig. 2 (continued).

18 à 64 ans

DIRECTIVES CANADIENNES EN MATIÈRE DE MOUVEMENT SUR 24 HEURES

POUR LES ADULTES ÂGÉS DE 18 À 64 ANS :

Une approche intégrée regroupant l'activité physique, le comportement sédentaire et le sommeil

PRÉAMBULE

Ce document est destiné aux décideurs politiques, aux professionnels de la santé et aux chercheurs, et pourrait être utile aux membres du public intéressés.

Ces Directives en matière de mouvement sur 24 heures s'appliquent à tous les adultes âgés de 18 à 64 ans, sans égard au genre, à la culture ou au statut socioéconomique. Ces directives pourraient ne pas convenir aux femmes enceintes ou aux personnes vivant avec une limitation ou un problème de santé, âgées de 18 à 64 ans. Ces personnes devraient envisager de consulter le questionnaire *Menez une vie plus active*, des recommandations s'adressant spécifiquement aux personnes vivant avec une limitation ou un problème de santé, ou un professionnel de la santé pour obtenir des conseils.

Les adultes âgés de 18 à 64 ans devraient participer à une gamme d'activités physiques (p. ex. activités avec ou sans mise en charge, sports et loisirs) dans une variété d'environnements (p. ex. à la maison/au travail/dans la communauté; à l'intérieur/à l'extérieur; sur le sol/dans l'eau) et de contextes (p. ex. loisir, transport, travail, maison) quelle que soit la saison. Les adultes âgés de 18 à 64 ans devraient limiter les longues périodes de comportements sédentaires et adopter une hygiène de sommeil saine (routines, comportements et environnements qui amènent à bien dormir).

Suivre les Directives en matière de mouvement sur 24 heures est associé aux bienfaits suivants pour la santé :

- risque réduit de mortalité, de maladies cardiovasculaires, d'hypertension, de diabète de type 2, de plusieurs cancers, d'anxiété, de dépression, de démence, de gain de poids et d'un bilan lipidique qui comporte des risques;
- amélioration de la santé osseuse, du processus cognitif, de la qualité de vie et de la fonction physique.

Les avantages associés à l'adoption de ces directives surpassent de loin les risques potentiels. Suivre ces directives peut parfois être difficile; tout progrès vers l'atteinte de l'une ou l'autre des cibles des directives entraînera des bienfaits pour la santé.

Ces Directives en matière de mouvement sur 24 heures reposent sur les meilleures données probantes disponibles, un consensus d'experts, des consultations auprès des intervenants, et des facteurs associés aux valeurs et aux préférences, à l'applicabilité, à la faisabilité et à l'équité. Un glossaire et plus de renseignements sur les directives, leur interprétation, le contexte de la recherche, ainsi que des conseils sur la façon de les atteindre de même que des recommandations sur la recherche et la surveillance futures sont disponibles à <https://scpe.ca/directives/>.



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- Physical activities that challenge balance. *Strong recommendation, very low-quality evidence.*
- Several hours of light physical activities, including standing. *Strong recommendation, low-quality evidence.*
- Limiting sedentary time to 8 h or less, which includes no more than 3 h of recreational screen time and breaking up long periods of sitting as often as possible. *Strong recommendation, very low-quality evidence.*

Fig. 2 (concluded).

DIRECTIVES CANADIENNES EN MATIÈRE DE MOUVEMENT SUR 24 HEURES ADULTES (ÂGÉS DE 18 À 64 ANS)

Pour obtenir des bienfaits pour la santé, les adultes âgés de 18 à 64 ans devraient être physiquement actifs chaque jour, limiter les comportements sédentaires et dormir suffisamment.

Un 24 heures sain comprend :

ACTIVITÉ PHYSIQUE

Une variété de types et d'intensités d'activité physique, ce qui inclut :



- des activités physiques **aérobies d'intensité moyenne à élevée** d'une durée cumulative d'au moins 150 minutes par semaine;

- des activités pour renforcer les muscles et faisant appel aux groupes musculaires importants au moins deux fois par semaine;



- plusieurs heures d'**activités physiques d'intensité légère**, incluant des périodes en position debout.

SOMMEIL



De 7 à 9 heures de sommeil de bonne qualité de façon régulière avec des heures de coucher et de lever régulières.

COMPORTEMENT SÉDENTAIRE



Un maximum de 8 heures de sédentarité, ce qui inclut :

- un maximum de 3 heures de temps de loisir devant un écran;
- une interruption aussi fréquente que possible des longues périodes en position assise.



Remplacer les comportements sédentaires par plus d'activité physique, et remplacer l'activité physique de faible intensité par plus d'activité physique d'intensité moyenne à élevée, tout en maintenant une durée de sommeil suffisante, entraînent encore plus de bienfaits pour la santé.



Tout progrès vers l'atteinte de l'une ou l'autre de ces cibles entraînera des bienfaits pour la santé.



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- Getting 7 to 8 h of good-quality sleep on a regular basis, with consistent bed and wake-up times. *Strong recommendation, moderate- (sleep duration) and very low- (sleep consistency) quality evidence.*
- Replacing sedentary behaviour with additional physical activity and trading light physical activity for more moderate to vigorous physical activity, while preserving sufficient sleep, can provide greater health benefits. *Strong recommendation, very low-quality evidence.*

Development of recommendations and determination of strength of recommendations

In accordance with the GRADE framework (Alonso-Coello et al. 2016b), the CP considered the proposed wording of the recommendations and the rating of their strength (strong or conditional/

weak), based on the balance of benefits to harms, the quality of evidence, sensitivity to values and preferences of stakeholders and end-users, the potential impact on biological sex, social and health equity, as well as acceptability, feasibility, and resource implications. This collection of information was used to inform the direction (i.e., for or against) and the strength (i.e., strong or conditional/weak) of the recommendations.

Physical activity

MVPA

To arrive at the MVPA recommendation, the CP leveraged evidence from the recently published US Scientific Report (2018

Fig. 3. Canadian 24-Hour Movement Guidelines for Adults 65 years or older.

65 years or older

CANADIAN 24-HOUR MOVEMENT GUIDELINES

FOR ADULTS 65 YEARS OR OLDER:

An Integration of Physical Activity, Sedentary Behaviour, and Sleep

PREAMBLE

This document is intended for use by policy makers, health professionals, and researchers, and it may be useful to interested members of the public.

These 24-Hour Movement Guidelines are relevant to adults aged 65 years or older, irrespective of gender, cultural background, or socio-economic status. These Guidelines may not be appropriate for adults aged 65 years or older living with a disability or a medical condition; these individuals should consider consulting the *Get Active Questionnaire*, disability/condition-specific recommendations, or a health professional for guidance.

Adults aged 65 years or older should participate in a range of physical activities (e.g., weight bearing/non-weight bearing, sport and recreation) in a variety of environments (e.g., home/work/community; indoors/outdoors; land/water) and contexts (e.g., leisure, transportation, occupation, household) across all seasons. Adults aged 65 years or older should limit long periods sedentary behaviours and should practice healthy sleep hygiene (routines, behaviours, and environments conducive to sleeping well).

Following the 24-Hour Movement Guidelines is associated with these health benefits:

- a lower risk of mortality, cardiovascular disease, hypertension, type 2 diabetes, several cancers, anxiety, depression, dementia, weight gain, adverse blood lipid profile, falls and fall-related injuries; and
- improved bone health, cognition, quality of life and physical function.

The benefits of following these Guidelines far exceed potential harms. Following these Guidelines may be challenging at times; progressing towards any of the Guideline targets will result in some health benefits.

These 24-Hour Movement Guidelines were informed by the best available evidence, expert consensus, stakeholder consultation, and consideration of values and preferences, applicability, feasibility, and equity. A glossary and more details on the Guidelines, the background research, their interpretation, guidance on how to achieve them, and recommendations for further research and surveillance are available at <https://csep.ca/guidelines>.



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Physical Activity Guidelines Advisory Committee 2018). Within that report the authors concluded that “Strong evidence demonstrates that a strong inverse dose–response relation exists between amount of moderate-to-vigorous physical activity and cardiovascular disease mortality”; and that “Strong evidence demonstrates that the dose–response relationships between

moderate-to-vigorous physical activity and all-cause mortality do not vary by age, sex, race, or weight status.” For both observations, the US Scientific Report assigned a “strong” grade. Further, the summary findings from 38 systematic reviews led to the conclusion that the majority of risk reduction in all-cause mortality, cardiovascular disease mortality, and incidence of car-

Fig. 3 (continued).

CANADIAN 24-HOUR MOVEMENT GUIDELINES FOR ADULTS (AGED 65 YEARS OR OLDER)

For health benefits, adults aged 65 years or older should be physically active each day, minimize sedentary behaviour, and achieve sufficient sleep.

A healthy 24 hours includes:

PHYSICAL ACTIVITY

Performing a variety of types and intensities of physical activity, which includes:



- **Moderate to vigorous aerobic physical activities** such that there is an accumulation of at least 150 minutes per week
- Muscle strengthening activities using major muscle groups at least twice a week
- Physical activities that challenge balance



- Several hours of **light physical activities**, including standing

SLEEP



Getting 7 to 8 hours of good-quality sleep on a regular basis, with consistent bed and wake-up times

SEDENTARY BEHAVIOUR



Limiting sedentary time to 8 hours or less, which includes:

- No more than 3 hours of recreational screen time
- Breaking up long periods of sitting as often as possible



Replacing sedentary behaviour with additional physical activity and trading light physical activity for more moderate to vigorous physical activity, while preserving sufficient sleep, can provide greater health benefits.



Progressing towards any of these targets will result in some health benefits.



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diovascular disease (CVD), stroke, and heart failure was achieved in adults who perform at least 150 to 300 min per week of moderate-intensity physical activity, 75 to 150 min of vigorous-intensity physical activity, or an equivalent combination of MVPA.

Upon reflection, the CP decided that the numerous combinations of moderate, vigorous, or equivalent combinations of MVPA offered in the US Scientific Report may well confuse the public. To improve comprehension while staying true to the evidence, and to be consistent with previous Physical Activity Guidelines for Adults and Older Adults in Canada (Tremblay et al. 2011), the CP decided that regardless of age, adults should strive to accumulate

at least 150 min of MVPA per week. It was the judgement of the CP that 150 min of MVPA or more per week should be given a strong recommendation.

The Physical Activity Guidelines for Adults and Older Adults in Canada released in 2011 recommend that the MVPA component be performed in bouts of at least 10 min duration (Tremblay et al. 2011), a recommendation consistent with other countries and jurisdictions worldwide at the time (U.S. Department of Health and Human Services 2008; World Health Organization 2010). The US Scientific Report acknowledged that the recommendation to perform MVPA in bouts of ≥ 10 min was based on very little empirical evidence. Accordingly, 1 of the systematic reviews within the US

Fig. 3 (continued).

65 ans et plus

DIRECTIVES CANADIENNES EN MATIÈRE DE MOUVEMENT SUR 24 HEURES POUR LES ADULTES ÂGÉS DE 65 ANS ET PLUS :

Une approche intégrée regroupant l'activité physique, le comportement sédentaire et le sommeil

PRÉAMBULE

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Les adultes âgés de 65 ans et plus devraient participer à une gamme d'activités physiques (p. ex. activités avec ou sans mise en charge, sports et loisirs) dans une variété d'environnements (p. ex. à la maison/au travail/dans la communauté; à l'intérieur/à l'extérieur; sur le sol/dans l'eau) et de contextes (p. ex. loisir, transport, travail, maison) quelle que soit la saison. Les adultes âgés de 65 ans et plus devraient limiter les longues périodes de comportements sédentaires et adopter une hygiène de sommeil saine (routines, comportements et environnements qui amènent à bien dormir).

Suivre les Directives en matière de mouvement sur 24 heures est associé aux bienfaits suivants pour la santé :

- risque réduit de mortalité, de maladies cardiovasculaires, d'hypertension, de diabète de type 2, de plusieurs cancers, d'anxiété, de dépression, de démence, de gain de poids, d'un bilan lipidique qui comporte des risques, de chutes et de blessures liées à des chutes;
- amélioration de la santé osseuse, du processus cognitif, de la qualité de vie et de la fonction physique.

Les avantages associés à l'adoption de ces directives surpassent de loin les risques potentiels. Suivre ces directives peut parfois être difficile; tout progrès vers l'atteinte de l'une ou l'autre des cibles des directives entraînera des bienfaits pour la santé.

Ces Directives en matière de mouvement sur 24 heures reposent sur les meilleures données probantes disponibles, un consensus d'experts, des consultations auprès des intervenants, et des facteurs associés aux valeurs et aux préférences, à l'applicabilité, à la faisabilité et à l'équité. Un glossaire et plus de renseignements sur les directives, leur interprétation, le contexte de la recherche, ainsi que des conseils sur la façon de les atteindre de même que des recommandations sur la recherche et la surveillance futures sont disponibles à <https://scpe.ca/directives/>.



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Scientific Report was completed to determine whether performing MVPA in bouts of ≥ 10 min was required for health benefit. To the contrary, the findings from cross-sectional and prospective cohort studies suggested that physical activity accumulated in bouts that are ≤ 10 min in duration are also associated with benefits across a variety of health outcomes, including all-cause mortality (Jakicic

et al. 2019). The authors noted, however, that the complete absence of findings from randomized controlled trials prevented causal inference and thus, represented a gap in knowledge that should be addressed in future studies. Based on these observations the CP agreed to remove the requirement that MVPA be performed in bouts of ≥ 10 min from the MVPA recommendation.

Fig. 3 (concluded).

DIRECTIVES CANADIENNES EN MATIÈRE DE MOUVEMENT SUR 24 HEURES ADULTES (ÂGÉS DE 65 ANS ET PLUS)

Pour obtenir des bienfaits pour la santé, les adultes âgés de 65 ans et plus devraient être physiquement actifs chaque jour, limiter les comportements sédentaires et dormir suffisamment.

Un 24 heures sain comprend :

ACTIVITÉ PHYSIQUE

Une variété de types et d'intensités d'activité physique, ce qui inclut :



- des activités physiques aérobies d'intensité moyenne à élevée d'une durée cumulative d'au moins 150 minutes par semaine;

- des activités pour renforcer les muscles et faisant appel aux groupes musculaires importants au moins deux fois par semaine;

- des activités physiques qui font appel à l'équilibre;



- plusieurs heures d'activités physiques d'intensité légère, incluant des périodes en position debout.

SOMMEIL



De 7 à 8 heures de sommeil de bonne qualité sur une base régulière avec des heures de coucher et de lever régulières.

COMPORTEMENT SÉDENTAIRE



Un maximum de 8 heures de sédentarité, ce qui inclut :

- un maximum de 3 heures de temps de loisir devant un écran;
- une interruption aussi fréquente que possible des longues périodes en position assise.



Remplacer les comportements sédentaires par plus d'activité physique, et remplacer l'activité physique de faible intensité par plus d'activité physique d'intensité moyenne à élevée, tout en maintenant une durée de sommeil suffisante, entraînent encore plus de bienfaits pour la santé.



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LPA

The LPA recommendation was not derived on the basis of a de novo systematic review conducted by our group to determine whether LPA (e.g., walking at a slow or leisurely pace (~3 km/h or less, equivalent to 1.5–<3.0 METs) was associated with health outcomes. However, the findings from 2 recently completed systematic reviews that considered the associations between LPA and all-cause mortality were presented to the CP (Chastin et al. 2019; Ekelund et al. 2019). Ekelund and colleagues (2019) examined the dose–response associations between device-measured LPA (accelerometry) and all-cause mortality in 36 383 adult men and women (73%) with a mean age of 63 years with a mean follow-up of

5.8 years. The novel finding was that device-measured LPA was associated with a substantially reduced risk of death in a dose–response manner (Ekelund et al. 2019). This finding was consistent with the meta-analysis of Chastin and colleagues (2019) who reported that a doubling of the time spent in LPA was associated with a 29% reduction in mortality.

The CP also noted that standing was an important component of LPA, and that evidence from a study of 16 586 Canadian adults aged 18 to 90 years suggested that time spent standing is inversely related to all-cause mortality (Katzmarzyk et al. 2009). In that study, across successively higher categories of daily standing, the multivariable-adjusted hazard ratios were 1.00, 0.79, 0.79, 0.73,

and 0.67 for all-cause mortality; 1.00, 0.82, 0.84, 0.68, and 0.75 for CVD mortality; and 1.00, 0.76, 0.63, 0.67, and 0.65 for other mortality. There was no association between standing and cancer mortality. The CP concluded that standing should be identified as a component of LPA and thus, was included in the LPA recommendation.

The CP considered that the findings from the systematic reviews were strong as they were based on device-measures (Ekelund et al. 2019), were current (both published in 2019), and were comprehensive as both included a large number of studies. It was also acknowledged that the health benefits identified in these reviews were consistent with the integration of movement behaviours analysis, demonstrating that health would improve if time during the day was reallocated from sedentary behaviour into LPA (Janssen et al. 2020). The CP recognized that the benefits of engaging in LPA far outweighed any potential harm; that encouraging participation in routine activities of daily living at home, work, or commuting would not be onerous; and that engaging in LPA is feasible for most if not all adults regardless of age. This is consistent with the Stakeholder Survey results, which indicated that using the guidelines would be feasible (83.6%), acceptable (68.3%), negligible cost (65.6%), and equitable (85.4%). Irrespective of biological sex, race, ethnicity, or socioeconomic status. Considering this evidence in the context of a 24-h day, which includes recommendations regarding sleep, sedentary behaviour, and MVPA, the CP agreed that several hours of LPA, which would comprise the remainder of the day, should be a strong recommendation.

Resistance exercise

The overview of reviews provided evidence that the benefits of RT (i.e., lower risk of mortality or myocardial infarction, improved blood pressure (indirect measure of incident CVD, included to assess effect of dose or age), muscle strength, and physical functioning) are likely to outweigh the potential harms (very low-quality evidence overall; El-Kotob et al. 2020). The potential benefits for mortality and, in particular the moderate quality evidence for improvements in physical functioning, provide support to recommend RT (Guyatt et al. 2013). Feedback from stakeholders revealed that 87.6% of the respondents aged 18–64 years and aged 65 years or older strongly agreed or somewhat agreed with how the recommendations were stated, and 65.6% of stakeholders agreed that the costs to implement the physical activity guidelines would be low or negligible (only 2.7% disagreed). There was debate concerning whether the recommendations should be strong or conditional. While the evidence pertaining to harms was rated as very low quality, there was evidence from 22 trials of 898 participants suggesting that serious adverse events were infrequent. Moreover, other national and international physical activity guidelines strongly recommend muscle strengthening activities using major muscle groups be performed at least twice a week because of the potential benefit relative to harms, providing further support for broad acceptability (World Health Organization 2015; Piercy et al. 2018). On the basis of these observations, the CP agreed that muscle strengthening activities using major muscle groups should be strongly recommended.

The previous Canadian Physical Activity Guidelines recommended adding “muscle and bone strengthening activities using major muscle groups, at least two days per week” (Tremblay et al. 2011). The CP considered whether changes to these recommendations were warranted, including changes to the recommended mode, frequency, or intensity of RT. Overall, there was evidence that a variety of RT programs (e.g., different intensities, durations, and types) were favourably associated with health outcomes. There was no statistically significant dose–response effect of RT frequency on risk of all-cause mortality (low-quality evidence; Saeidifard et al. 2019); indeed performing 1–2 sessions of RT was associated with lower all-cause mortality, and the effects of more than 2 sessions of RT per week were not statistically significantly

different than 1–2 sessions. When comparing effects on muscle strength, the effect of frequency was inconsistent when it came to muscles of the upper and lower body, and estimates were imprecise (very low-quality evidence; Ralston et al. 2018). Thus, there was insufficient evidence to support a change in the current recommended frequency of muscle strengthening of major muscle groups at least twice per week (Tremblay et al. 2011). The CP discussed whether the intensity, degree of effort, or mode of RT should be made explicit in the recommendations, to avoid confusion as to what constitutes RT. However, a variety of intensities and modes of RT were associated with benefits, and there was no conclusive evidence on the superiority of 1 intensity or mode. Therefore, the CP decided that the intensity or mode would not be specified in the recommendations, but that knowledge dissemination or translation around recommended types of RT should reflect how existing evidence defined RT.

The CP considered whether RT should be included as part of the recommendation for MVPA. However, compositional analyses used to inform the recommendation of 150 min of MVPA did not include RT (Janssen et al. 2020). Some CP members felt that it would be important to encourage both MVPA and RT to avoid encouraging only RT or only aerobic physical activity. Thus, the consensus was that we should keep RT as separate from the MVPA recommendation, consistent with previous guidelines. Finally, prior guidelines recommended “muscle and bone strengthening” (Tremblay et al. 2011), and we discussed whether “bone strengthening” should be included as part of the RT recommendation. Bone strengthening includes both RT and impact exercise, but the latter could also include types of MVPA, thus it may be confusing to include bone strengthening with the RT recommendation only. Therefore, the CP decided to remove bone strengthening, and instead mention the importance of impact exercise and RT for bone in the preamble and messaging. There were insufficient data to determine whether the effects were different in adults aged 18–64 years compared with adults aged 65 years or older, but there was evidence of the benefits of RT in adults between the ages of 18–64 years and over 65 years of age (Inder et al. 2016; Lai et al. 2018; Ashton et al. 2020), supporting the decision to retain the recommendations (Tremblay et al. 2011) for strengthening activities in both age groups.

Balance and functional training

In the overview of reviews, no systematic reviews that examined the effects of balance and functional training on the critical or important outcomes in adults aged 18 to 64 years were identified (McLaughlin et al. 2020). Given the evidence in favour of balance and functional training for adults 65 years and older, the CP considered whether it would be advisable to recommend balance and functional training for adults aged 18–64 years in anticipation of needs later in life (i.e., before balance becomes impaired). The CP concluded that there was insufficient evidence to support a recommendation for balance and functional training for adults aged 18 to 64 years, which is consistent with the previous Canadian Physical Activity Guidelines for Adults (18–64 years; Tremblay et al. 2011).

For adults aged 65 years and older, there was evidence that the benefits of balance and functional training outweighed potential harms. The overall quality of the evidence was rated as very low. Although the review by Sherrington et al. (2019) rated the evidence pertaining to adverse events as very low quality, adverse event data from the intervention groups of 15 balance and functional training trials comprising 4167 participants suggested that the potential for harm did not outweigh the evidence pertaining to fall prevention. There were no studies that provided clear evidence of the most effective or minimum dose (frequency, intensity or duration; McLaughlin et al. 2020). Specifying a frequency may be less important than encouraging older adults to engage in daily activities that routinely challenge balance (Clemson et al.

2012). Although there was evidence regarding the effectiveness of different types of activities that challenge balance (e.g., balance and functional training, Tai Chi, yoga, or games with virtual reality or visual feedback), there was no evidence directly comparing these activities.

The previous Canadian Physical Activity Guidelines recommended “physical activities to enhance balance and prevent falls” for adults aged 65 years or older (Tremblay et al. 2011). To reflect the types of physical activities for which there was evidence (i.e., tailored exercise or physical activities that provide a sufficient challenge to balance), this terminology was changed to “physical activities that challenge balance” in the current guidelines. The phrase “and prevent falls” was deleted because there was evidence for other outcomes in addition to “falls” (i.e., physical functioning, fall-related fractures, physical activity levels). In addition, the previous guidelines (Tremblay et al. 2011) recommended balance activities only for “those with poor mobility”. The evidence indicated that the effect of balance and functional training on rate of falls or risk of having 1 or more falls was not different in individuals with higher versus lower fall risk at baseline (Sherrington et al. 2019). Therefore, in the current guidelines, the evidence supported a recommendation of activities that challenge balance for all adults aged 65 years and older.

Sedentary behaviour

The CP leveraged evidence from the recently published US Scientific Report (2018 Physical Activity Guidelines Advisory Committee 2018) to prevent research waste and help determine the SED recommendation. Within that report the authors concluded that “Strong evidence demonstrates a significant relationship between greater time spent in sedentary behaviour and [1] higher all-cause mortality rates and [2] higher mortality rates from cardiovascular disease”; and that “Strong evidence demonstrates the existence of a direct, curvilinear dose–response relationship between sedentary behaviour and all-cause mortality, with an increasing slope at higher amounts of sedentary behaviour.” The authors also concluded that “Strong evidence demonstrates the existence of a direct, positive dose–response relationship between sedentary behaviour and mortality from cardiovascular disease.” For all observations, the Physical Activity Guidelines Advisory Committee assigned a “strong” grade. The authors of the US Scientific Report also concluded that *limited evidence* was available to suggest that the relationships between sedentary behaviour and these outcomes did not vary by age, sex, race/ethnicity, or weight status.

Our sedentary behaviour overview of reviews is consistent with the US Scientific Report and suggests that adults who limit their sedentary behaviour have more favourable levels of several critical and important health outcomes in adults and older adults (Saunders et al. 2020). Most studies did not examine whether these results varied as a function of age, sex, race/ethnicity, socioeconomic status, weight status, or chronic disease status. The overall quality of evidence was low or very low for the critical health outcomes and low for important health outcomes. Taken together, the findings of our overview of reviews and the US Scientific Report support the recommendation to limit sedentary behaviour.

The findings from the overview of reviews and the US Scientific Report did not identify specific threshold values for daily sedentary behaviour or recreational screen time. However, following much discussion, the CP concluded that specific recommendations were unlikely to cause harm and had the potential for considerable benefit for end users (Chaput et al. 2020c; Neumann and Schünemann 2020). Our sedentary behaviour recommendations were informed by recent meta-analyses (Grøntved and Hu 2011; Chau et al. 2013; Sun et al. 2015; Ekelund et al. 2016, 2019; Ku et al. 2018, 2019; Patterson et al. 2018). These studies suggested that the risk of all-cause mortality increased more rapidly above threshold

values ranging from 7 to 9.5 h/day for daily sedentary behaviour (Chau et al. 2013; Ku et al. 2018, 2019; Patterson et al. 2018; Ekelund et al. 2019), with lower thresholds generally observed for self-reported sedentary behaviour and higher thresholds for device-measured sedentary time (Ku et al. 2018). With respect to screen-based sedentary behaviours, the risk of all-cause mortality was reported to increase above a threshold of 3 (Grøntved and Hu 2011; Ekelund et al. 2016), 3.5 (Patterson et al. 2018), and 4 h/day (Sun et al. 2015) of daily TV viewing, although Ekelund et al. (2016) noted a threshold of 5 h/day for those in the most physically active quartile.

It was considered impractical to provide a range of thresholds (i.e., no more than 7–9.5 h/day for total sedentary behaviour, or 3–4 h/day for recreational screen time). Eight hours/day was the approximate mid-point of the inflection points identified for daily sedentary behaviour and was therefore recommended as the threshold (target) for this behaviour. The reported inflection points for recreational screen time were more tightly clustered between 3 and 4 h/day; a threshold of 3 h/day was therefore suggested as most appropriate. The CP had prolonged and thoughtful discussion regarding these recommendations, which are based on the above evidence as well as the informed opinion of panel experts, and the observation that the benefits associated with adherence to the recommendations outweighed any possible negative consequence. In addition, more than 88.5% of stakeholders agreed with the wording of these recommendations, with few concerns (<11% of respondents) regarding the decision to include a threshold for daily sedentary behaviour or recreational screen time. The CP also recognized that these recommendations would likely stimulate further investigation and research on the health impact of sedentary behaviour across the adult lifespan.

Although the available dose–response evidence for screen-based sedentary behaviours relates to TV viewing, it was felt that a recommendation specific to TV viewing would not be appropriate based on changing media consumption habits (Prince et al. 2020). While some potential benefits of Internet and computer use were identified for older adults, there was no evidence to suggest that this should exceed 3 h/day. For these reasons, and to be consistent with the recommendations for Children and Youth (Tremblay et al. 2016, 2017b), our Guidelines refer to recreational screen time.

The overview of reviews also suggested that breaking up long periods of sitting had beneficial impacts on markers of cardiometabolic risk and body composition (Saunders et al. 2020). However, no specific threshold values were identified for the optimal timing or frequency of breaks in prolonged sitting. It was also noted that some individuals may not be able to break up their sitting behaviour at a specified frequency given their occupation or personal circumstances. Therefore, the CP recognized that the recommendation should be to break up long periods of sitting as often as possible, rather than provide a specific frequency. In summary, on the basis of these observations, the CP concluded that the sedentary behaviour recommendations should be rated as “strong” for both adults (18–64 years) and adults aged 65 years and older.

Sleep

For the sleep duration overview of reviews (Chaput et al. 2020a), the dose–response curves showed that a sleep duration of around 7–8 h per day was most favourably associated with the critical health outcomes that were examined. Most studies did not examine a possible modification of the effect by age. The overall quality of evidence was moderate for the critical health outcomes examined. The CP decided to recommend 7–9 h of sleep per day for adults (18–64 years) and 7–8 h for adults aged 65 years and older for several reasons. First, bringing the upper limit to 9 h instead of 8 h for adults aged 18–64 years was considered likely to be associated with more benefits than harms. There is no plausible biolog-

ical mechanism by which an additional hour of sleep can harm health and the association between long sleep and poor health has been shown to be due to reverse causation and residual confounding (e.g., depression, chronic pain, obstructive sleep apnea) in previous studies among general and clinical populations (Knutson and Turek 2006; Stamatakis and Punjabi 2007; Chaput et al. 2018). We also do not want adults who typically sleep 9 h per day to restrict their sleep to 8 h, because there is large inter-individual variability in sleep needs (as reflected in the measures of variability in the dose–response data) and this strategy would likely adversely impact their health. Adults also tend to measure their sleep in terms of “time in bed” rather than actual sleep duration. For example, if someone is in bed for 9 h but only sleeps 7.5 of those hours, we would not want them to restrict their time in bed if the upper limit was 8 h. Moreover, conveying the message that sleep duration varies across the lifespan and shows an inverse association with age was judged important by the CP (Chaput et al. 2018). In general, most retired adults aged 65 years and older have decreased or no employment-related responsibilities and less obligatory sleep schedule demands (Hirshkowitz et al. 2015). Long sleep duration in older adults (i.e., ≥ 9 –10 h per day) is associated with comorbidities and mortality, and excessive sleep may be a marker signaling the need for medical evaluation (Hirshkowitz et al. 2015). This explains why we recommended 7–8 h of sleep per day for adults aged ≥ 65 years. Finally, our recommendations are consistent with those of the National Sleep Foundation in the United States (Hirshkowitz et al. 2015). Although their guideline development process differed from ours, it was robust; a multidisciplinary expert panel in the United States relied on a systematic assessment of the evidence, used a formal consensus and voting process, and used the RAND/UCLA Appropriateness Method to formulate their sleep duration recommendations.

Sleep quality was not specifically reviewed but was deemed an important additional consideration. The “good-quality sleep” qualifier was added to the guidelines because of the compelling body of evidence demonstrating that both sleep duration and sleep quality are important for overall health (Ohayon et al. 2017) and to be consistent with the Canadian 24-Hour Guidelines for other age groups (Tremblay et al. 2016, 2017b). The National Sleep Foundation in the United States also has specific sleep quality recommendations (Ohayon et al. 2017).

For the sleep timing and consistency *de novo* systematic review (Chaput et al. 2020b), the available evidence indicated that earlier sleep timing and regularity in sleep patterns with consistent bed-times and wake-up times were favourably associated with health, with no apparent modification of the effect by age. However, because most studies reported linear associations between sleep timing/consistency and health outcomes, it was not possible to identify thresholds for “late sleep timing” or “large sleep variability”. The overall quality of evidence was very low based on GRADE. We thus recommended “consistent bed and wake-up times” in general terms given the absence of evidence for more specific thresholds. We did not specifically add a recommendation about earlier sleep timing such as going to bed and waking up earlier to respect the chronotype of people (Rittonja et al. 2018; Taylor and Hasler 2018). Moreover, this may not be possible for adults with young children and/or those who work atypical hours. Finally, by meeting the sleep duration recommendation (stronger evidence based on GRADE), sleep timing automatically needs to be adjusted (e.g., adults may have to go to bed earlier on weekdays to achieve 7–9 h of sleep). The CP judged that the sleep recommendations should be rated as “strong” for both adults and older adults because the potential benefits of adhering to the guidelines far outweigh any potential harms. Findings from the stakeholder survey also indicated that using the sleep guidelines would be feasible (83.6%), cost-effective (65.6%), and equitable (85.4%), further supporting the CP decision to provide a “strong” recommendation.

Composition of movement behaviours

The systematic review of compositional data analysis studies reported that the composition of movement behaviours across the 24-h day is associated with health outcomes (Janssen et al. 2020). This is an important observation and supports the notion that recommendations for sleep, sedentary behaviour, and physical activity can and should be combined into a single public health guideline that encompasses movement across the full 24-h day. Estimates from time reallocation models suggest that (i) health would improve if time was reallocated into MVPA irrespective of what other movement behaviour(s) that time was reallocated from; (ii) health would improve if some of the time spent in sedentary behaviour during waking hours was reallocated into LPA; and (iii) reallocating time from sedentary behaviour into sleep would benefit health while reallocating time from physical activity into sleep would be unfavourable to health. Based on these time reallocation findings, the CP included the following statement in the guidelines: “Replacing sedentary behaviour with additional physical activity and trading light physical activity for more moderate to vigorous physical activity, while preserving sufficient sleep, can provide greater health benefits.” Because the overall pattern of results did not present a picture of the 24-h movement behaviour composition being a weaker or stronger predictor of health outcomes in adults younger than 65 years versus adults aged 65 or older, the integrated messages included in the guidelines are the same for both age groups.

Other GRADE considerations

Values and preferences of stakeholders

The CP considered the importance (values and preferences) of stakeholders and end-users when rating the identified outcomes as critical/important/not important at the first CP meeting. The stakeholder survey results revealed that the recommendations were important to almost all (87.5%) of the respondents, and that by comparison to separate movement guidelines, most (73.1%) indicated that the integrated 24-h movement guidelines are “more” or “much more” useful. The assessments of stakeholder values and preferences, together with the broad range of health indicators/outcomes included in the systematic reviews that informed these recommendations, provide support for the conclusion that there is little or no uncertainty about preferences regarding the main outcomes examined.

Resource requirements

In addition to the input via the stakeholder survey regarding cost and resource use, the CP considered a body of evidence that addressed savings to the health care system from increasing levels of physical activity and decreasing sedentary behaviour as an additional consideration that informed discussion on the resource implications of the recommendations. Evidence supports that there are substantial health savings possible to the health care system resulting from adherence to the guideline recommendations. There is evidence that the costs associated with the recommended behaviours are low, and the costs associated with not engaging in the recommended behaviours are high (Katzmarzyk et al. 2009; Janssen 2012; Bounajm et al. 2014). In addition, there is evidence that not following the guidelines can result in greater resource use. For example, the estimated direct, indirect, and total health care costs of physical inactivity in Canada in 2009 were \$2.4, \$4.3, and \$6.8 billion, respectively, values that represent 3.8%, 3.6%, and 3.7% of the overall health care costs in Canada. These estimated cost savings are reinforced by a recent economic analysis in Australia demonstrating that the potential annual cost saving remains more than \$1000 per adult (\$1121) from meeting (≥ 150 min/week) versus not meeting (< 150 min/week) the MVPA guidelines (Eckermann et al. 2020). Further, it is estimated that increasing physical activity and reducing sedentary behaviour would reduce Canada’s health care costs “by \$2.6 billion and in-

ject \$7.5 billion into the Canadian economy by the year 2040" (Bounajm et al. 2014). There is also evidence in adults that inadequate sleep has a substantial economic impact (e.g., via performance deficits, accident rates, and health care utilization) and significant public health implications (Institute of Medicine (US) Committee on Sleep Medicine and Research 2006; Hillman and Lack 2013).

The CP also received input via the stakeholder survey on opinions regarding cost and resource use. Most stakeholders (65.6%) agreed that the costs associated with implementing the recommendations would be small or negligible compared with not using the guidelines. Most stakeholders (69.9%) also agreed that the benefits of using the guideline recommendations are likely to outweigh the costs (e.g., time, financial) in their professional work. In the judgment of the CP, considering the available information, the cost-effectiveness of the recommendations is supported. Based on these observations the CP concluded that the guideline recommendations have beneficial implications from a resource perspective, in addition to the benefits with respect to health indicators.

Equity, acceptability, and feasibility

The CP recognized that achieving the target recommendation for any or all movement behaviours may be challenging for some adults. Meeting the recommendation for sitting may be difficult for some occupations (e.g., truck drivers) and for sleep (e.g., shift workers). The CP acknowledged this challenge and responded by including the observation within the Preamble of both the Adults aged 18–64 and Adults aged 65 years and older guidelines noting that "Following these Guidelines may be challenging at times; progressing towards any of the Guideline targets will result in some health benefits".

The CP also received input through the stakeholder survey regarding feasibility and applicability. Most stakeholders (85.4%) agreed that following these recommendations would benefit adult Canadians regardless of age, biological sex, race, ethnicity, or socioeconomic status. In the judgment of the CP, implementing these recommendations would likely increase health equity (i.e., decrease health inequity). Similarly, most stakeholders (68.3%) indicated that they would "always" or "frequently" use the recommendations. Therefore, the CP concluded that these recommendations are acceptable. Finally, most stakeholders (83.6%) indicated that the recommendations were "somewhat" to "very easy" to use. Based on this information, in the judgment of the CP, the recommendations are feasible to implement.

Surveillance recommendations

For each recommendation contained in the guideline, the Surveillance Subcommittee suggested specific measures and, if appropriate, cut-points to define adherence to the recommendation. A rationale was provided for each of these suggestions. For each guideline recommendation the Subcommittee also considered whether adherence to that recommendation should be a requirement for minimal inclusion for overall 24-h guideline adherence. Analytical recommendations, such as whether self-reported and/or objective data should be used for surveillance, were also made. The recommendations and suggestions made by the Subcommittee are provided in Table 4. It is recommended that for an adult to be considered to meet the new guidelines, they need to meet the specific time recommendations for sleep duration, sedentary time, recreational screen time, and MVPA. Overall guideline adherence can be assessed using self-reported data alone or a combination of self-reported and objectively measured data, but the mode of data collection should be reported with prevalence levels.

KT

Concurrent with the guideline development process, the KT Advisory Committee established the target audiences for guideline dissemination and implementation and conducted formative research to inform the design of dissemination and implementation efforts for the selected target audiences. Given the increased attention on KT from the onset of the guideline development process, the KT efforts for the new guidelines include novel contributions to enhance awareness and use of the new guidelines among Canadians. For example, in addition to development of the scientific guideline documents for health professionals, policy-makers and researchers, a focus of the dissemination efforts was the creation of public-facing materials to resonate with members of the general public (Appendix B). Further, a theoretically informed implementation intervention is being collaboratively designed, representing the first multicomponent attempt to enhance use of the new guidelines. An evaluation plan of dissemination and implementation efforts is in place and will be reported following guideline release. Full details outlining the KT process and outcomes are found in Tomasone et al. (2020a).

Research gaps

Research gaps identified throughout the guideline development process including the systematic reviews, compositional analyses, CP meetings, and Leadership Committee meetings are listed in Table 5. Consistent with prior Canadian 24-Hour Movement Guidelines (Tremblay et al. 2016, 2017b), numerous data and research gaps have been identified. This is a consequence of moving from the generation of guidelines based on the isolation of a single behaviour to those that integrate several behaviours. Importantly, the research gaps identified will help inform the research questions that underpin the future of guideline development and movement behaviour integration.

External review: AGREE II assessment

The initial summary evaluation from the AGREE II assessment is provided in Table 6. Four independent reviewers applied the AGREE II assessment, and domain score averages were computed using the AGREE II Instrument calculation (Brouwers et al. 2016).

The guideline development process was scored very high (Domain average ratings across the 4 external reviewers ranged from 87.5% to 93.8%), and all assessors indicated that they would recommend the guidelines for use.

Discussion

In this report we describe the process used to generate the Canadian 24-Hour Movement Guidelines for Adults aged 18–64 years and Adults aged 65 years or older, a world first. In doing so we complete the development of 24-Hour Movement Guidelines for Canadians across the lifespan. The guideline development process adhered to the framework used to develop previous 24-Hour Movement Guidelines for Children and Youth (aged 5 to 17 years; Tremblay et al. 2016) and the Early Years (aged 0–4 years; Tremblay et al. 2017).

The CP was tasked with the development of 2 guidelines: for adults aged 18 to 64 and for adults aged 65 years or older. The development procedures for both guidelines were comprehensive and transparent incorporating both de novo systematic reviews and overview of reviews to summarize and assess current knowledge (Kho et al. 2020). The final guideline recommendations were informed by the best available evidence, expert consensus, stakeholder consultation, and consideration of values and preferences, applicability, feasibility, and equity. The guidelines (Figs. 2–3) are presented using a format consistent with previous 24-Hour Movement Guidelines (Tremblay et al. 2016, 2017b), wherein the context for the guidelines is given through a preamble followed by the guidelines themselves. The preamble and guidelines as presented in Figs. 2–3 are intended for policy makers, health

Table 4. Surveillance recommendations for the new Canadian 24-Hour Movement Behaviour Guidelines for Adults aged 18–64 years and Adults aged 65 years or older.

Movement behaviour	Guideline recommendation	Surveillance recommendation	Rationale for surveillance recommendation	Required for minimal inclusion in overall guideline adherence		Analytical recommendation
					Yes	
Sleep	<i>Adults aged 18–64 y:</i> Getting 7 to 9 h of good-quality sleep on a regular basis <i>Adults aged ≥65 y:</i> Getting 7 to 8 h of good-quality sleep on a regular basis Consistent bed and wake-up times	<i>Adults aged 18–64 y:</i> Average daily sleep duration is 7:00–9:59 h:min <i>Adults aged ≥65 y:</i> Average daily sleep duration is 7:00–8:59 h:min None	The evidence that informed the guideline is primarily based on studies that used self-reported measures of average daily sleep duration in their analyses The evidence suggests that different sleep duration thresholds are needed for adults and older adults Using an average allows for some normal day-to-day variability An accepted threshold for determining bed and wake-up time consistency is not currently available, so no specific surveillance recommendation is being made		Yes	Self-reported sleep data should be used for surveillance
Sedentary behaviour	Limiting sedentary time to 8 h or less	Average daily sedentary time is ≤8:00 h:min	The evidence that informed the guideline is primarily based on studies that used average daily sedentary time in their analyses The evidence is based on studies that used self-reported (e.g., sitting time questionnaire) and objective measures (e.g., waist-worn accelerometer) Using an average allows for some normal day-to-day variability The evidence that informed the guideline is primarily based on studies that used self-reported, average daily TV time in their analyses The Consensus Panel felt that the guideline should be for screen time rather than TV time per se given the changing dynamics of screen time Using an average allows for some normal day-to-day variability		Yes	Self-reported sitting time or accelerometer measured sedentary time can be used for surveillance*†
	No more than 3 h of recreational screen time	Average daily sedentary recreational screen time is ≤3:00 h:min			Yes	Self-reported data that captures a variety of recreational screen time behaviours (e.g., watching TV and videos, playing video games, browsing the web, texting, etc.) should be used for surveillance

Table 4 (continued).

Movement behaviour	Guideline recommendation	Surveillance recommendation	Rationale for surveillance recommendation	Required for minimal inclusion in overall guideline adherence	Analytical recommendation
	Breaking up prolonged sitting	None	An accepted threshold for determining prolonged sitting is not currently available so no specific surveillance recommendation is being made	No	In the absence of a specific threshold, average bout length, median bout length, and the proportion of bouts spent at different durations (e.g., <30 min, 30–59 min, 60–119 min, ≥120 min) could be reported Accelerometer, inclinometer, or some other objective measures should be used for surveillance
Physical activity	Several hours of light physical activities, including standing	Average daily time spent in light physical activity	The evidence that informed the guideline is primarily based on studies that used average daily light physical activity in their analyses as measured using a waist-worn accelerometer Until enough evidence emerges to provide a specific threshold for light physical activity, the average should be monitored	No	Objective measures of light physical activity, such as with an accelerometer, should be used for surveillance
	Some moderate to vigorous aerobic physical activities such that there is an accumulation of at least 150 min/wk	Total weekly time spent in moderate-to-vigorous aerobic physical activities is ≥150 min	The evidence that informed the guideline is primarily based on studies that used average daily or total weekly moderate to vigorous physical activity in their analyses Although the evidence is primarily based on studies that used self-reported data, in recent years it has been corroborated based on evidence from accelerometer data The evidence that informed the guideline also indicated that moderate-to-vigorous physical activity does not need to be accumulated on every day or most days as long as the weekly total is achieved	Yes	Self-reported measures of moderate-to-vigorous physical activity, such as with a questionnaire, or objective measures of moderate-to-vigorous physical activity, such as with an accelerometer, could be used for surveillance. Caution should be taken when making direct comparisons between measures collected using different methodologies Physical activity recommendations have previously stipulated that activity needed to last at least 10 min to be counted (i.e., obtained in bouts of 10 min or more). The evidence that informed this guideline indicated that both bouts and non-bouted moderate-to-vigorous physical activity can benefit health, so the 10-min bout stipulation was removed

Table 4 (continued).

Movement behaviour	Guideline recommendation	Surveillance recommendation	Rationale for surveillance recommendation	Required for minimal inclusion in overall guideline adherence	Analytical recommendation
	Muscle strengthening activities using major muscle groups at least twice a week	Average frequency of muscle strengthening activities is ≥ 2 times per week	Evidence for a specific duration of muscle strengthening activities is lacking so the new guideline only speaks to the frequency This evidence that informed this guideline is based on RCT or observational studies that used self-reported data. Objective measures cannot assess this type of physical activity	No	Self-reported data should be used for surveillance of the muscle strengthening recommendation
	<i>Adults aged ≥ 65 y:</i> Activities that challenge balance	<i>Adults aged ≥ 65 y:</i> Average frequency of participating in activities that challenge balance is ≥ 1 time per week. This could include balance activities that also fall in the moderate-to-vigorous aerobic activity category or the muscle strengthening category	Evidence on activities that challenge balance is limited to older adults Evidence for a specific duration or frequency of activities that challenge balance is lacking so the new guideline only speaks to participating in balance activities Objective measures cannot assess participation in all activities that challenge balance	No	Self-reported data should be used for surveillance of the balance activities recommendation

Note: RCT, randomized controlled trial.

*Caution should be taken when making direct comparisons between sedentary time measures collected using different methodologies.

[†]The 8-h sedentary time threshold reflects a blending of results from accelerometer measured sedentary time, where the threshold was around 9 h, and self-reported sitting time, where the threshold was around 7 h.

Table 5. Research gaps identified through the guideline development process.**Research needs arising from overviews of systematic reviews and systematic reviews of primary studies**

- Need for high-quality studies with stronger designs (e.g., randomized controlled trials or longitudinal studies, larger sample sizes, objective measures)
- Examine possible dose–response relationships between movement behaviours and health outcomes, an examination of the effect of different doses (i.e., duration, frequency) of resistance training, balance and functional training, sedentary behaviour, and sleep on health outcomes is needed
- Further examination of whether associations differ between demographic subgroups (i.e., based on age, sex, race/ethnicity, socioeconomic status, or weight status)
- Examination of how smartphones, social media, or other forms of new media impact health
- Examination of the relationship between occupational sedentary behaviour and health outcomes
- Studies that compare the health impacts of mentally active and mentally passive forms of sedentary behaviour
- Further research on the relationship between sedentary behaviour and sleep
- Examination of the impact of sleep quality, sleep timing, sleep consistency, napping, and daytime alertness on health, including determining clear cut-points for public health guidance
- Studies that examine sleep duration over multiple time points are needed to better capture the chronic effects of sleep duration over time, specifically related to long-term disease incidence
- Exploration of the associations between resistance training and incident type 2 diabetes, incident depression, brain health, bone health, incident cancer, and fall-related injuries or falls are needed
- Exploration of the associations between sleep duration and health-related quality of life, work productivity, physical activity, and sedentary behaviour are needed
- Exploration of the associations between sleep timing and consistency and mortality, falls, and work productivity are needed

Research needs arising from compositional analyses

- Longitudinal and intervention research to confirm cross-sectional findings
- Research utilizing valid approaches for measuring all intensities of movement not just moderate-to-vigorous physical activity to better examine the relative contribution of movement behaviours
- Research further utilizing compositional data analysis statistical techniques to explore the associations between movement behaviours and a wider variety of health outcomes (there were findings for only 4 of the 15 critical health outcomes in this review)
- Research examining whether associations differ between demographic subgroups (i.e., based on age, sex, race/ethnicity, socioeconomic status, or weight status)

Research needs arising from consensus panel meetings and discussions

- Physical activity
 - Research examining different doses of resistance training e.g., varying frequencies or intensities of resistance training
 - Research examining the benefits of resistance training independent of and in addition to, moderate-to-vigorous intensity aerobic physical activity for a number of health outcomes (e.g., mortality, mood, falls, bone health, cardiovascular disease, diabetes, harms, others)
 - Research examining the acute effect of a single bout of physical activity on health
 - Research examining the relationship between light-intensity physical activity and health outcomes
 - Role of standing on health
 - Research examining the impact of functional and balance training on health in adults aged 18–64 y and higher quality research examining effects of functional and balance training on physical function, quality of life, and harms
- Sedentary behaviour
 - Research further examining the role of bouts and breaks in relation to health outcomes
 - Research exploring replacing sitting for with standing
- Sleep
 - Research focusing on sleep quality (e.g., sleep efficiency) is needed
 - Research further examining the effect of catch-up sleep (e.g., getting more sleep on weekends or napping) on health
 - Further exploration of how screens in the bedroom impact sleep
 - Research examining transitioning to sleep, and how studies can identify and distinguish sedentary time spent in bed (e.g., on phone in bed) from sleep time
- Integrated movement behaviours
 - Time-use research (e.g., how time use changes over the rest of the day when adults increase their time spent in moderate-to-vigorous physical activity)

Other research needs

- Cost effectiveness analyses of implementing the new guidelines at both organizational and individual levels
- Comparisons between jurisdictions of the prevalence of adults meeting the 24-h guidelines and examination of correlates and determinants that may explain differences
- Examination of within and between family variance in meeting 24-h movement guidelines
- Research into best practice for dissemination and implementation of guidelines at a national scale

professionals, and researchers. User-friendly messaging materials targeting the general public were developed as outlined in the KT section of the Results. An implementation intervention aiming to enhance use of the 24-Hour Movement Guidelines among postsecondary students is planned. An evaluation of the dissemination and implementation activities is also in the development stage.

The fundamental assertion of 24-Hour Movement Guidelines is that the integration of all movement behaviours throughout the

day is associated with health, and provides unique, evidence-based opportunities to engage in movement behaviour compositions that reflect and respect the individuality, variability, and personal preferences of the end user. This paradigm shift away from a focus on a single movement behaviour to the integration of all movement behaviours reflects a growing body of evidence suggesting that the mixture of the movement behaviours that comprise a 24-hour day influences a range of health outcomes (Chastin et al. 2015; McGregor et al. 2018, 2019). These early obser-

Table 6. Appraisal of Guidelines for Research and Evaluation (AGREE) II Reporting Grid.

AGREE II item	Reporting location	Initial domain score ^a
Domain 1. Scope and purpose		87.5
1. The overall objective(s) of the guideline is (are) specifically described	Process paper, Introduction	
2. The health question(s) covered by the guideline is (are) specifically described	Process paper, Table 2	
3. The population (patients, public, etc.) to whom the guideline is meant to apply is specifically described	Process paper, preamble, Table 2	
Domain 2. Stakeholder involvement		87.5
4. The guideline development group includes individuals from all the relevant professional groups	Process paper, Table 1	
5. The views and preferences of the target population (patients, public, etc.) have been sought	Process paper, Stakeholder consultations, Table 3 , Faught et al. (2020) paper	
6. The target users of the guideline are clearly defined	Process paper, guideline preamble	
Domain 3. Rigour of development		90.6
7. Systematic methods were used to search for evidence	Process paper; Individual systematic reviews and overviews of reviews	
8. The criteria for selecting the evidence are clearly described	Process paper, individual systematic reviews and overviews of reviews	
9. The strengths and limitations of the body of evidence are clearly described	Process paper	
10. The methods for formulating the recommendations are clearly described	Process paper, guidelines recommendations	
11. The health benefits, side effects and risks have been considered in formulating the recommendations	Process paper, ETD summary	
12. There is an explicit link between the recommendations and the supporting evidence	Process paper, ETD summary	
13. The guideline has been externally reviewed by experts prior to its publication	Process paper, Table 6	
14. A procedure for updating the guideline is provided	Process paper, Discussion	
Domain 4. Clarity of presentation		93.8
15. The recommendations are specific and unambiguous	Process paper, NA ^b	
16. The different options for management of the condition or health issue are clearly presented		
17. Key recommendations are easily identifiable	Figures 2 and 3	
Domain 5. Applicability		91.7
18. The guideline describes facilitators and barriers to its application	Public-facing messages. To come ^c	
19. The guideline provides advice and/or tools on how the recommendations can be put into practice	Public-facing messages. To come ^c	
20. The potential resource implications of applying the recommendations have been considered	Process paper, Table 3 , Faught et al. (2020) paper	
21. The guideline presents monitoring and/or auditing criteria	Process paper, Surveillance Recommendations, Table 4	
Domain 6. Editorial independence		93.8
22. The views of the funding body have not influenced the content of the guideline	Process paper, Acknowledgements	
23. Competing interests of guideline development group members have been recorded and addressed	Process paper, Table 1	

Note: ETD, evidence to decision; NA, not applicable.

^aFour independent reviewers applied the AGREE II assessment using available documents at the time of manuscript submission. The Initial Domain Scores (%) were calculated by summing up all the scores of the individual items in a domain and by scaling the total as a percentage of the maximum possible score for that domain (ref). Following receipt of these comments, we clarified reporting where possible.

^bItem 16 was rated as “not applicable” by 3 reviewers and the assessment of the other reviewer was included in the scaled Domain 4 score.

^cItems 17 and 18 were rated as “not applicable” by 2 reviewers and the assessment of the other two reviewers were included in the scaled Domain 5 score. Item 19 was rated by a single reviewer (without having access to the public-facing documents) based on the knowledge that the relevant materials were in development by an experienced group.

variations were reinforced by the systematic review regarding the composition of movement behaviours in this special supplement providing additional justification for the packaging of recommendations for sleep, sedentary behaviour, and physical activity into the Canadian 24-Hour Movement Guidelines ([Janssen et al. 2020](#)). Key findings from the systematic review of compositional data analysis identify the potential health benefits of reallocating time from 1 behaviour to another. For this reason, the guidelines for

both adults aged 18 to 64 years and adults aged 65 years or older include the statement that “Replacing sedentary behaviour with additional physical activity and trading light physical activity for more moderate to vigorous physical activity, while preserving sufficient sleep, can provide greater health benefits.” These seminal messages have considerable implications for the promotion of public health and are unique to the fundamental principles that underscore 24-Hour Movement Guidelines.

The 24-Hour Movement Guidelines that append this report (Figs. 2–3) reveal that with few exceptions, the physical activity components for both age groups are similar. The recommendation that adults of all ages strive to achieve at least 150 min per week of MVPA is consistent with previous Physical Activity Guidelines for Adults and Older Adults in Canada (Tremblay et al. 2011). The notable exception to the previous guidelines is the decision to omit the requirement that the accumulation of MVPA be acquired in bouts ≥ 10 min. This evidence-informed decision has important public health implications as it suggests that increasing MVPA, regardless of bout length, is likely associated with benefit across a variety of health outcomes (2018 Physical Activity Guidelines Advisory Committee 2018; Jakicic et al. 2019). The CP acknowledged that this observation is particularly relevant for individuals who may be unable or unwilling to engage in MVPA bouts that are ≥ 10 min in duration. Encouraging participation in MVPA of any length throughout the day provides additional options for adults of all ages, which facilitates engagement and promotes opportunities to increase movement behaviour and thus, mitigate health risk.

The recommendation that a healthy 24-hour day for both adults aged 18 to 64 years and 65 years or older includes several hours of LPA is a new recommendation for adults that has several public health implications. The CP acknowledged that the evidence base for this recommendation is limited. However, it is encouraging that emerging evidence clearly demonstrates that LPA is associated with a substantially reduced risk of all-cause mortality in a dose-response manner (Chastin et al. 2019; Ekelund et al. 2019). The CPs confidence of the importance of LPA was reinforced by the results of the compositional analysis demonstrating that replacing sedentary time with LPA is associated with a decrease in mortality (Janssen et al. 2020). These observations underscore the importance of 24-Hour Movement Guidelines that encourage the adoption of physical activity behaviours over the entire waking day regardless of duration and/or intensity. The CP also noted that the LPA recommendation would support public health initiatives that advocate for engaging in quiet standing (instead of sitting), and routine activities of daily living such as casual walking, taking a flight of stairs instead of the elevator and doing household chores.

The guideline recommendations for sedentary and sleep behaviour represent the first time Canadian adults regardless of age have evidence-based guidelines for either behaviour. For sedentary behaviour, the recommendation to limit sedentary time to less than 8 h per day is for adults of all ages (Saunders et al. 2020). It is also recommended that adults regardless of age try and break up long periods of sitting and limit daily recreational screen time to 3 h or less. The CP had prolonged and thoughtful discussion regarding the threshold values for both recommendations and whether a recommendation specific to screen time should be included. In addition to the evidence reviewed (Saunders et al. 2020), the Panel based the recommendations on the informed opinion of panel experts, stakeholder input, and the observation that the benefits associated with adherence to the recommendations outweighed any possible negative consequence. The CP also recognized that these recommendations would stimulate additional investigation that would advance the field and help refine future guidelines.

The recommendation for sleep differs slightly for the 2 age group guidelines. For adults aged 18 to 64 years, the recommendation is that adults attain 7–9 h of sleep per day whereas for adults aged 65 years and older, the recommendation is to achieve 7–8 h of sleep per day (Chaput et al. 2020a). The supporting rationale for the distinctive recommendations is given elsewhere in this special supplement (Chaput et al. 2020a). The CP recognized the importance of sleep as an integral part of a healthy day and sought to assure that sleep was not sacrificed with attempts to either increase physical activity or decrease sedentary behaviour. Accordingly, the guideline recommends replacing sedentary be-

haviour with additional physical activity while preserving sufficient sleep.

The guideline recommending that both adult age groups perform muscle-strengthening activities using major muscle groups at least twice a week (El-Kotob et al. 2020), and that adults greater than 65 years of age perform activities that challenge balance (McLaughlin et al. 2020) is consistent with the Physical Activity Guidelines for Adults and Older Adults in Canada released in 2011 (Tremblay et al. 2011). A notable exception to the wording of the muscle strengthening recommendation is the omission of a reference to bone strengthening, which was a part of the muscle strengthening recommendation in 2011 (Tremblay et al. 2011). The CP considered that the inclusion of “bone strengthening” with “using major muscle groups” within the same recommendation may be confusing to end users. It was also recognized that modalities of MVPA (e.g., impact exercise) could improve bone strength. Taken together the decision was made to omit bone strengthening from the muscle strengthening recommendation. It is noteworthy, however, that “improved bone health” is identified as a benefit of following the 24-Hour Movement Guidelines within the Preamble of both guidelines. The wording of the recommendation that a healthy 24-h day for adults aged 65 years or older include *physical activities that challenge balance* also differs from the physical activity guidelines for older adults released in 2011 (Tremblay et al. 2011); the associated rationale is provided earlier in this report (see Balance and functional training section).

Consistent with previous 24-Hour Movement Guidelines, the guidelines here do not provide precise recommendations for each behaviour that would sum to 24 h. To the contrary, ranges are provided for the behaviour components (e.g., no more than 3 h of recreational screen time, several hours of light physical activities, 7 to 9 h of good-quality sleep) reflecting best evidence, and respects that individual movement behaviour for any given day is influenced by numerous factors including personal motivation, health, social and socioeconomic issues, workplace, and the built environment in which the individual lives. To provide precise recommendations would undermine the extraordinary opportunities that are inherent to the 24-Hour Movement Guidelines that provide a variety of movement options that mitigate health risk regardless of age. In contrast to the restriction in movement options that result from a focus on a single movement behaviour, guideline recommendations based on the integration of movement behaviours cater to individual differences in ability and feasibility, provide a wide variety of daily movement options for the practitioner, and consequently promote a positive health message that will empower the end-user.

Early in the guideline development process the CP recognized that there was a need for a long-term plan for dissemination and implementation of the guidelines in an effort to avoid “launching and leaving”. As a result, the decision was made to form a KT Advisory Committee to ensure that an integrated KT process was undertaken to engage relevant organizations, stakeholders, researchers, and end-users to guide all stages of the guideline KT process. Important outcomes of the KT procedure include (i) a governance structure, terms of reference, and decision-making criteria for a guideline KT team; (ii) selection of the target audiences for dissemination and implementation efforts, along with a series of formative research projects to ensure KT efforts met the needs of the selected target audiences; (iii) a robust rationale and evidence to inform the first Canadian public-facing versions of a 24-Hour Movement Guideline; (iv) a novel focus on developing an implementation intervention to enhance guideline use; (v) an evaluation structure; and (vi) a framework and sharing of lessons learned that can serve as a template for other groups seeking to enhance dissemination and implementation of their guidelines. These outcomes will hopefully result in an increase in the uptake of the guidelines and will serve as a template for future guideline development panels.

Strengths and limitations

Strengths of the guideline development process include strict adherence to guideline development standards that are well established (Tremblay and Haskell 2012) and consistent with past 24-Hour Movement Guidelines (Tremblay et al. 2016, 2017b), independent assessment by methodological consultants, involvement of a broad range of relevant experts, international collaborators, stakeholders and end-users, and consideration of a range of health indicators as well as new systematic reviews and overviews to develop the knowledge base. The decision to form a KT committee early in the guideline development process with expertise in the dissemination, implementation, and evaluation of the guidelines will help ensure uptake of the guidelines across a wide range of stakeholders and end-users.

Based on GRADE criteria, the quality of evidence for most of the guideline recommendations were rated as *low* or *very low*. However, thoughtful consideration was given to the wording of the recommendations and rating of their strength (strong or conditional/weak) was based on the balance between desirable and undesirable effects, the quality of evidence, the values and preferences of stakeholders, as well as acceptability, feasibility, and resource implications. Based on a careful consideration of these GRADE criteria collectively, the CP was confident in the favorable balance observed between the desirable and undesirable consequences and thus, rated all recommendations as *strong* despite low- or very-low quality evidence. Other limitations include a paucity of research that informed specific aspects of the guidelines (e.g., dose-response studies on behaviour frequency, intensity, or duration). The integrated analysis was primarily informed by a single systematic review that was limited to studies that used compositional analysis to examine how movement across the full 24-h day is associated with health. However, this is both a limitation and a strength. It is a weakness because compositional data analysis, while a well-established statistical technique, has only been used by a small group of movement behaviour scientists over the past 5 years. It is a strength because compositional data analysis allows researchers to simultaneously study the health effects of all movement behaviours in a manner that recognizes and statistically accounts for their inherent codependency. Accordingly, our conclusion that the composition of movement behaviours across a 24-h day is associated with health should be interpreted with this strength and limitation in mind.

Updating the guidelines

With the current release of the Canadian 24-Hour Movement Guidelines for Adults aged 18–64 and Adults aged 65 years or older, we complete the set of movement guidelines that now provide recommendations for the integrated movement behaviours across the life span. This series of three 24-Hour Movement Guidelines have been completed over a relatively short period of time (2015–2020). The next and last step in guideline development is to consider the strategy that will be implemented to update and revise the guidelines. Previous guideline development panels have recommended that the guidelines be updated and released every 10 years or whenever important new evidence is identified that could inform and/or suggest revisions to the existing guideline recommendations (Tremblay et al. 2016). A 10-year cycle would allow appropriate time for dissemination and implementation strategies to take hold among stakeholders and end-users across Canada, and for researchers to address important research gaps.

Unlike the commitment to update and revise Canada's Dietary Guidelines every 10 years (i.e., Canada's Food Guide), which is mandated under federal legislation — the *Food and Drugs Act inclusive of Food and Drug Regulations*, there is no existing federal legislation to support a regular cycle for updating the 24-Hour Movement Guidelines. Thus, there is no assurance that the guidelines will ever be updated despite public health importance. The CSEP has a

long standing and proud history of leading the development and release of Physical Activity, Sedentary Behaviour, and more recently, 24-Hour Movement Guidelines in partnership with the federal government and scientific and policy experts. The CSEP remains committed to working with its partners to ensure that the 24-Hour Movement Guidelines are updated and revised on a predetermined cycle to ensure Canadians receive the best possible guidance and consequently mitigate health risk. Therefore, the CP calls on the federal government to pass legislation that would mandate the update and release of the 24-Hour Movement Guidelines every 10 years.

Conclusion

The Canadian 24-Hour Movement Guidelines for Adults aged 18–64 years and Adults aged 65 years or older: An Integration of Physical Activity, Sedentary Behaviour, and Sleep completes the set of 24-Hour Movement Guidelines that together provide recommendations for healthy movement behaviours for the whole day for all Canadians. The Guidelines were generated based on the best available evidence with extensive consultation and stakeholder feedback. The CP recognized that to adopt and sustain any movement behaviour in today's environment presents very real challenges for all adults. It is hoped that the shift in focus from movement behaviours in isolation to the integration of all movement behaviours over the whole day will provide movement options for adults, treatment options for practitioners, and greater opportunities for public health promotion.

Conflict of interest statement

Julie Carrier reports grants from Canopy Growth, grants from Rana, grants from Philipps/Respironics, grants from Merck, and grants from Eisai, outside the submitted work. Mary Duggan reports grants from the PHAC to CSEP. Michelle Kho reports receiving personal fees from the CSEP and Canada Research Chairs Grants, outside of the submitted work. Kaleigh Maclaren reports receiving grants from the PHAC to CSEP. Sharon Marr reports receiving stipends from the Department of Medicine (Geriatric Medicine) and RGPC, holds a patent with GCP (official trademark) and receives grant funding from CIHR, the Centre for Aging and Brain Health Innovation, the Physicians' Services Inc. Foundation, and the Provincial Geriatrics Leadership Office, outside of the submitted work. Veronica Poitras reports receiving personal fees from the CSEP and is an employee of the Canadian Agency for Drugs and Technologies in Health. Robert Ross reports receiving grants from CIHR, outside of the submitted work. Amanda Ross-White reports receiving personal fees from the CSEP and personal fees from ProQuest LLC, outside of the submitted work. Travis Saunders reports receiving grants from PHAC during the conduct of the study and personal fees from PHAC and the PEI Public Schools Branch. He has also received conference funding from Ergotron outside of the submitted work. Mark Tremblay reports leading similar guidelines for Canada for the Early Years (0–4 years) and Children and Youth (5–17 years) for the CSEP.

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Appendix A. Stakeholder survey

English survey

Section 1

The Canadian Society for Exercise Physiology (CSEP) is the owner, copyright holder, and national organization leading the development of the Canadian 24-Hour Movement Guidelines for Adults and Canadian 24-Hour Movement Guidelines for Older Adults. Queen's University is conducting this survey on behalf of CSEP. Funding for these Guidelines has been provided by the Public Health Agency of Canada.

Section 2: Letter of information

Study title: Examining perceptions and brand approaches for the Canadian 24-Hour Movement Guidelines for Adults and Older Adults.

Principal Investigator: Jennifer Tomasone, School of Kinesiology and Health Studies, Queen's University.

After reviewing the evidence, experts have produced draft versions of the Canadian 24-Hour Movement Guidelines for Adults and Older Adults. As a relevant stakeholder in Canada connected with physical activity, sedentary, and/or sleep behaviours, you are being invited to participate in a survey soliciting your opinion on these draft versions of the 24-Hour Movement Guidelines. You will be asked for your feedback and level of agreement with the content of the 24-Hour Movement Guidelines. This information is important for the alignment of strategic efforts in policy, practice, and the promotion of health to Canadian adults and older adults.

There are no direct risks associated with participating in the survey. You may benefit from early exposure to the 24-Hour Movement Guidelines and may become more equipped to promote and implement them. Participation in this survey is voluntary and should take approximately 20 minutes. You do not have to answer any questions you do not want to. You can stop participating at any time without penalty. The survey does not collect information about your name or email address and responses will be presented in group format only. Since the data are anonymous, withdrawal after completion of the survey is not possible. The study team will have access to your study data during and after collection. Queen's General Research Ethics Board (GREB) may request access to study data to ensure that the researcher(s) have or are meeting their ethical obligations in conducting this research. GREB is bound by confidentiality and will not disclose any personal information. Your data will be stored securely for at least five years as per Queen's University Policy. After 5 years, your data will be archived. The results of this survey will be shared with parties involved in the development and promotion of the 24-Hour Movement Guidelines for Adults and Older Adults.

If you have any questions about the research, please contact the principal investigator at tomasone@queensu.ca or 613-533-6000 ext. 79193.

If you have any ethics concerns, please contact the General Research Ethics Board (GREB) at 1-844-535-2988 (Toll free in North America) or email chair.GREB@queensu.ca.

You have not waived any legal rights by consenting to participate in this study.

Please note that the Guidelines are currently in draft form and stakeholder consultation is being sought. The final versions of the Guidelines will be released October 2020. As a valued and trusted stakeholder, we have shared confidential draft recommendations for your feedback. Please do not share the recommendations. If you have further inquiries, please contact the Guideline development Chair, Dr. Robert Ross, at rossr@queensu.ca.

By clicking "Next" to begin the survey, you are consenting to participate.

Thank you for your time!

Section 3

1. What is your age in years?

2. What is your gender?

- ☐ Male
- ☐ Female
- ☐ Other
- ☐ Prefer not to specify

3. What are the ethnic or cultural origins of your ancestors? Please select as many as are applicable.

- ☐ British Isles (e.g., English, Irish, Scottish)
- ☐ Other race
- ☐ French
- ☐ Other European (e.g., German, Russian, Italian, Norwegian)

- ☐ Aboriginal (e.g., Inuit, Métis, North American Indian)
- ☐ Other North American (e.g., Canadian, American, Newfoundlander, Québécois)
- ☐ Caribbean (e.g., Jamaican, Barbadian, Cuban, West Indian)
- ☐ Latin, Central and South American (e.g., Mexican, Argentinian, Guatemalan, Peruvian)
- ☐ African (e.g., South African, Ethiopian, Nigerian, Zimbabwean)
- ☐ Arab/West Asian (e.g., Lebanese, Moroccan, Iranian, Turk)
- ☐ South Asian (e.g., East Indian, Pakistani, Goan, Sri Lankan)
- ☐ Chinese
- ☐ Other East and Southeast Asian (e.g., Filipino, Vietnamese, Korean, Japanese)
- ☐ Oceania (e.g., Australian, New Zealander, Fijian, Samoan)
- ☐ Jewish (non-denominational)
- ☐ Other

4. What is your household income?

- ☐ Less than \$24,999
- ☐ \$25,000 to \$34,999
- ☐ \$35,000 to \$49,999
- ☐ \$50,000 to \$74,999
- ☐ \$75,000 to \$99,999
- ☐ \$100,000 to \$124,999
- ☐ \$125,000 or more
- ☐ Undisclosed

5. What is the highest level of education you have completed?

- ☐ No certificate, diploma or degree
- ☐ Secondary (high) school diploma or equivalent
- ☐ Apprenticeship or trades certificate or diploma
- ☐ College, CEGEP or other non-university certificate or diploma
- ☐ University certificate or diploma below bachelor level; university certificate, diploma or degree at bachelor level or above: bachelor's degree; university certificate or diploma above bachelor level; degree in medicine, dentistry, veterinary medicine or optometry; master's degree; earned doctorate.

6. With what sector(s) do you associate? Select any that apply.

- ☐ Sport
- ☐ Education
- ☐ Recreation
- ☐ Care for older adults
- ☐ Healthcare
- ☐ Public health
- ☐ Non-governmental organization
- ☐ Research
- ☐ Government
- ☐ Other, please specify:

7. Are you a member of the Sedentary Behaviour Research Network?

- ☐ Yes
- ☐ No

8. Where do you primarily work?

- ☐ Alberta
- ☐ British Columbia
- ☐ Manitoba
- ☐ New Brunswick
- ☐ Newfoundland
- ☐ Northwest Territories
- ☐ Nova Scotia
- ☐ Nunavut
- ☐ Ontario

- ☐ Prince Edward Island
- ☐ Quebec
- ☐ Saskatchewan
- ☐ Yukon Territory
- ☐ Across Canada (i.e., National)
- ☐ Outside Canada, please specify:

Section 4

You will now be asked questions about the Canadian 24-Hour Movement Guidelines for Adults and Older Adults. Any differences between the two sets of guidelines will be highlighted.

TITLE: Canadian 24-Hour Movement Guidelines for Adults (age 18–64 years): An Integration of Physical Activity, Sedentary Behaviour, and Sleep

TITLE: Canadian 24-Hour Movement Guidelines for Older Adults (aged 65 years or older): An Integration of Physical Activity, Sedentary Behaviour, and Sleep

1. The Titles are clearly stated.

- ☐ Strongly Agree
- ☐ Somewhat Agree
- ☐ Neither Agree Nor Disagree
- ☐ Somewhat Disagree
- ☐ Strongly Disagree

2. I _____ with how the Titles are stated.

- ☐ Strongly Agree
- ☐ Somewhat Agree
- ☐ Neither Agree Nor Disagree
- ☐ Somewhat Disagree
- ☐ Strongly Disagree

3. In the box below, please enter any comments you have regarding the Titles.

Section 5

Please note that the purpose of the Preamble is to provide context for the Canadian 24-Hour Movement Guidelines.

PREAMBLE FOR ADULTS

These 24-Hour Movement Guidelines are relevant to **adults (aged 18–64 years)**, irrespective of gender, cultural background, or socio-economic status. These Guidelines may be appropriate for **adults who are pregnant** or persons living with a disability or a medical condition; these individuals should consider consulting the Get Active Questionnaire, disability/condition-specific recommendations, or a health professional for guidance.

Adults should participate in a range of physical activities (e.g., weight bearing/non-weight bearing, sport and recreation) in a variety of environments (e.g., home/work/community; indoors/outdoors; land/water) and contexts (e.g., leisure, transportation, occupation, household) across all seasons. **Adults** should limit periods of prolonged sedentary behaviours and should practice healthy sleep hygiene (routines, behaviours, and environments conducive to sleeping well).

Following these 24-Hour Movement Guidelines is associated with a lower risk of mortality, cardiovascular disease, hypertension, type 2 diabetes, several cancers, anxiety, depression, dementia, weight gain, adverse blood lipid profile and improved bone health, cognition, quality of life and physical function. The benefits of following these Guidelines far exceed potential harms.

These 24-Hour Movement Guidelines were informed by the best available evidence, expert consensus, stakeholder consultation, and consideration of values and preferences, applicability, feasibility, and equity. More details on the Guidelines, the background research, their interpretation, guidance on how to achieve them, and recommendations for further research and surveillance are available at <https://csepguidelines.ca/>.

PREAMBLE FOR OLDER ADULTS

These 24-Hour Movement Guidelines are relevant to **older adults (aged 65 years or older)**, irrespective of gender, cultural background, or socio-economic status. These Guidelines may be appropriate for older adults living with a disability or a medical condition; these individuals should consider consulting the Get Active Questionnaire, disability/condition-specific recommendations, or a health professional for guidance.

Older adults should participate in a range of physical activities (e.g., weight bearing/non-weight bearing, sport and recreation) in a variety of environments (e.g., home/work/community; indoors/outdoors; land/water) and contexts (e.g., leisure, transportation, occupation, household) across all seasons. **Older adults** should limit periods of prolonged sedentary behaviours and should practice healthy sleep hygiene (routines, behaviours, and environments conducive to sleeping well).

Following these 24-Hour Movement Guidelines is associated with a lower risk of mortality, cardiovascular disease, hypertension, type 2 diabetes, several cancers, anxiety, depression, dementia, weight gain, adverse blood lipid profile, **falls and fall-related injuries**, and improved bone health, cognition, quality of life and physical function. The benefits of following these Guidelines far exceed potential harms.

These 24-Hour Movement Guidelines were informed by the best available evidence, expert consensus, stakeholder consultation, and consideration of values and preferences, applicability, feasibility, and equity. More details on the Guidelines, the background research, their interpretation, guidance on how to achieve them, and recommendations for further research and surveillance are available at <https://csepguidelines.ca/>.

1. The Preambles are clearly stated.

- ☐ Strongly Agree
- ☐ Somewhat Agree
- ☐ Neither Agree Nor Disagree
- ☐ Somewhat Disagree
- ☐ Strongly Disagree

2. I _____ with how the Preambles are stated.

- ☐ Strongly Agree
- ☐ Somewhat Agree
- ☐ Neither Agree Nor Disagree
- ☐ Somewhat Disagree
- ☐ Strongly Disagree

3. I would use (e.g., circulate) the Preambles.

- ☐ Strongly Agree
- ☐ Somewhat Agree
- ☐ Neither Agree Nor Disagree
- ☐ Somewhat Disagree
- ☐ Strongly Disagree

4. In the box below, please enter any comments you have regarding the Preambles.

Section 6

The drafted Canadian 24-Hour Movement Guidelines for Adults and Older Adults are shown below.

GUIDELINES FOR ADULTS

For health benefits, **adults** should be physically active each day, minimize sedentary behaviour and achieve sufficient sleep.

A healthy 24-hours includes:

Performing a variety of types and intensities of physical activity, which includes:

- Moderate to vigorous aerobic physical activities such that there is an accumulation of at least 150 minutes per week
- Muscle strengthening activities using major muscle groups at least twice a week
- Several hours of light physical activities, including standing

Limiting sedentary time to 8 hours or less, which includes:

- No more than 3 h of recreational screen time, and
- Breaking up prolonged sitting as often as possible

Getting **7 to 9 hours** of good-quality sleep on a regular basis, with consistent bed and wake-up times.

Replacing sedentary behaviour with additional physical activity and trading light physical activity for more moderate to vigorous physical activity, while preserving sufficient sleep, can provide greater health benefits.

Progressing towards any of the above targets will result in some health benefits.

GUIDELINES FOR OLDER ADULTS

For health benefits, **older adults** should be physically active each day, minimize sedentary behaviour and achieve sufficient sleep.

A healthy 24-hours includes:

Performing a variety of types and intensities of physical activity, which includes

- Moderate to vigorous aerobic physical activities such that there is an accumulation of at least 150 minutes per week
- Muscle strengthening activities using major muscle groups at least twice a week
- **Physical Activities that challenge balance**
- Several hours of light physical activities, including standing

Limiting sedentary time to 8 hours or less, which includes

- No more than 3 hours of recreational screen time, and
- Breaking up prolonged sitting as often as possible

Getting **7 to 8 hours** of good-quality sleep on a regular basis, with consistent bed and wake-up times.

Replacing sedentary behaviour with additional physical activity and trading light physical activity for more moderate to vigorous physical activity, while preserving sufficient sleep, can provide greater health benefits.

Progressing towards any of the above targets will result in some health benefits.

We will ask for feedback on each recommendation in the questions to follow.

PHYSICAL ACTIVITY RECOMMENDATION FOR ADULTS

A healthy 24-hours includes:

Performing a variety of types and intensities of physical activity, which includes:

- Moderate to vigorous aerobic physical activities such that there is an accumulation of at least 150 minutes per week
- Muscle strengthening activities using major muscle groups at least twice a week
- Several hours of light physical activities, including standing

PHYSICAL ACTIVITY RECOMMENDATION FOR OLDER ADULTS

A healthy 24-hours includes:

Performing a variety of types and intensities of physical activity, which includes

- Moderate to vigorous aerobic physical activities such that there is an accumulation of at least 150 minutes per week
- Muscle strengthening activities using major muscle groups at least twice a week
- **Physical Activities that challenge balance**
- Several hours of light physical activities, including standing

1. The physical activity recommendations are clearly stated.

- ☐ Strongly Agree
☐ Somewhat Agree
☐ Neither Agree Nor Disagree
☐ Somewhat Disagree
☐ Strongly Disagree

2. I ____ with how the physical activity recommendations are stated.

- ☐ Strongly Agree
☐ Somewhat Agree
☐ Neither Agree Nor Disagree
☐ Somewhat Disagree
☐ Strongly Disagree

3. In the box below, please enter any comments you have regarding the physical activity recommendations.

SEDENTARY BEHAVIOUR RECOMMENDATION

A healthy 24-hours includes:

Limiting sedentary time to 8 hours or less, which includes:

- No more than 3 hours of recreational screen time, and
- Breaking up prolonged sitting as often as possible

4. The sedentary behaviour recommendation is clearly stated.

- ☐ Strongly Agree
☐ Somewhat Agree
☐ Neither Agree Nor Disagree
☐ Somewhat Disagree
☐ Strongly Disagree

5. I ____ with how the sedentary behaviour recommendation is stated.

- ☐ Strongly Agree
☐ Somewhat Agree
☐ Neither Agree Nor Disagree
☐ Somewhat Disagree
☐ Strongly Disagree

6. In the box below, please enter any comments you have regarding the sedentary behaviour recommendation.

SLEEP RECOMMENDATION FOR ADULTS

A healthy 24-hours includes:

Getting **7 to 9 hours** of good-quality sleep on a regular basis, with consistent bed and wake-up times.

SLEEP RECOMMENDATION FOR OLDER ADULTS

A healthy 24-hours includes:

Getting **7 to 8 hours** of good-quality sleep on a regular basis, with consistent bed and wake-up times.

7. The sleep recommendations are clearly stated.

- ☐ Strongly Agree
- ☐ Somewhat Agree
- ☐ Neither Agree Nor Disagree
- ☐ Somewhat Disagree
- ☐ Strongly Disagree

8. I ____ with how the sleep recommendations are stated.

- ☐ Strongly Agree
- ☐ Somewhat Agree
- ☐ Neither Agree Nor Disagree
- ☐ Somewhat Disagree
- ☐ Strongly Disagree

9. In the box below, In the box below, please enter any comments you have regarding the sleep recommendations.

INTEGRATED RECOMMENDATION FOR ADULTS

For health benefits, **adults** should be physically active each day, minimize sedentary behaviour and achieve sufficient sleep.

Replacing sedentary behaviour with additional physical activity and trading light physical activity for more moderate to vigorous physical activity, while preserving sufficient sleep, can provide greater health benefits.

Progressing towards any of the above targets will result in some health benefits.

INTEGRATED RECOMMENDATION FOR OLDER ADULTS

For health benefits, **older adults** should be physically active each day, minimize sedentary behaviour and achieve sufficient sleep.

Replacing sedentary behaviour with additional physical activity and trading light physical activity for more moderate to vigorous physical activity, while preserving sufficient sleep, can provide greater health benefits.

Progressing towards any of the above targets will result in some health benefits.

10. The integrated recommendations are clearly stated.

- ☐ Strongly Agree
- ☐ Somewhat Agree
- ☐ Neither Agree Nor Disagree
- ☐ Somewhat Disagree
- ☐ Strongly Disagree

11. I ____ with how the integrated recommendations are stated.

- ☐ Strongly Agree
- ☐ Somewhat Agree
- ☐ Neither Agree Nor Disagree
- ☐ Somewhat Disagree
- ☐ Strongly Disagree

12. In the box below, please enter any comments you have regarding the integrated recommendations.

Section 7

The drafted Canadian 24-Hour Movement Guidelines for Adults and Older Adults are shown below.

GUIDELINES FOR ADULTS

For health benefits, **adults** should be physically active each day, minimize sedentary behaviour and achieve sufficient sleep.

A healthy 24-hours includes:

Performing a variety of types and intensities of physical activity, which includes:

- Moderate to vigorous aerobic physical activities such that there is an accumulation of at least 150 minutes per week
- Muscle strengthening activities using major muscle groups at least twice a week
- Several hours of light physical activities, including standing

Limiting sedentary time to 8 hours or less, which includes:

- No more than 3 hours of recreational screen time, and
- Breaking up prolonged sitting as often as possible

Getting **7 to 9 hours** of good-quality sleep on a regular basis, with consistent bed and wake-up times.

Replacing sedentary behaviour with additional physical activity and trading light physical activity for more moderate to vigorous physical activity, while preserving sufficient sleep, can provide greater health benefits.

Progressing towards any of the above targets will result in some health benefits.

GUIDELINES FOR OLDER ADULTS

For health benefits, **older adults** should be physically active each day, minimize sedentary behaviour and achieve sufficient sleep.

A healthy 24-hours includes:

Performing a variety of types and intensities of physical activity, which includes

- Moderate to vigorous aerobic physical activities such that there is an accumulation of at least 150 minutes per week
- Muscle strengthening activities using major muscle groups at least twice a week
- **Physical Activities that challenge balance**
- Several hours of light physical activities, including standing

Limiting sedentary time to 8 hours or less, which includes

- No more than 3 hours of recreational screen time, and
- Breaking up prolonged sitting as often as possible

Getting **7 to 8 hours** of good-quality sleep on a regular basis, with consistent bed and wake-up times

Replacing sedentary behaviour with additional physical activity and trading light physical activity for more moderate to vigorous physical activity, while preserving sufficient sleep, can provide greater health benefits.

Progressing towards any of the above targets will result in some health benefits.

We will ask for feedback on each recommendation in the questions to follow.

USING THE CANADIAN 24-HOUR MOVEMENT GUIDELINES

1. How important are the 24-Hour Movement Guidelines to you in your professional work?

- ☐ Very important
- ☐ Important
- ☐ Moderately important
- ☐ Slightly important
- ☐ Not at all important

2. In the box below, please enter any comments you have regarding the previous question.

3. How relevant are the 24-hour Movement Guidelines to the population you work with?

- ☐ Very relevant
- ☐ Relevant
- ☐ Moderately relevant
- ☐ Slightly relevant
- ☐ Not at all relevant

4. In the box below, please enter any comments you have regarding the previous question.

5. How often would you use the 24-Hour Movement Guidelines in your professional work?

- ☐ Always
- ☐ Frequently
- ☐ Occasionally
- ☐ Seldom
- ☐ Never

6. In the box below, please enter any comments you have regarding the previous question.

7. How easy or difficult would you find using the 24-Hour Movement Guidelines?

- ☐ Very Easy
- ☐ Somewhat Easy
- ☐ Neither Easy Nor Difficult
- ☐ Somewhat Difficult
- ☐ Very Difficult

8. In comparison to separate movement behaviour guidelines, the integrated 24-Hour Movement Guidelines are...

- ☐ Much More Useful
- ☐ More Useful
- ☐ Neutral
- ☐ Less Useful
- ☐ Much Less Useful

9. In the box below, please enter any comments you have regarding the previous question.

10. The costs for you or your organization to implement the 24-Hour Movement Guidelines are likely to be small or negligible compared to not using the Guidelines.

- ☐ Strongly Agree
- ☐ Somewhat Agree
- ☐ Neither Agree Nor Disagree
- ☐ Somewhat disagree
- ☐ Strongly Disagree
- ☐ I Don't Know

11. In the box below, please enter any comments you have regarding the previous question.

12. The benefits of using the 24-Hour Movement Guidelines are likely to outweigh the costs (e.g., time, financial, opportunity, etc.) in your professional work.

- ☐ Strongly Agree
- ☐ Somewhat Agree
- ☐ Neither Agree Nor Disagree
- ☐ Somewhat disagree
- ☐ Strongly Disagree
- ☐ I Don't Know

13. In the box below, please enter any comments you have regarding the previous question.

14. Following the 24-Hour Movement Guidelines is likely to benefit adult and older adult Canadians irrespective of gender, race, ethnicity, or socioeconomic status.

- ☐ Strongly Agree
- ☐ Somewhat Agree
- ☐ Neither Agree Nor Disagree
- ☐ Somewhat disagree
- ☐ Strongly Disagree
- ☐ I Don't Know

15. In the box below, please enter any comments you have regarding the previous question.

16. In your opinion, who are the key intermediaries to implement the 24-Hour Movement Guidelines (e.g., primary care physicians)?

17. In your opinion, what supports do these intermediaries need to implement the 24-Hour Movement Guidelines (e.g., materials, training)?

18. In the box below, application et des recommandations sur la recherche et la please enter any comments you have regarding the 24-Hour Movement Guidelines.

Section 8

Thank you for your interest in the Canadian 24-Hour Movement Guidelines for Adults and Older Adults. The recommendations are currently in draft form and stakeholder consultation is being sought. The final versions of the Guidelines will be released in October 2020. As a valued and trusted stakeholder, we have shared confidential draft recommendations for your feedback. Please do not share this information with anyone. If you have further inquiries, please contact the Guideline development Chair, Dr. Robert Ross, at rossr@queensu.ca. **Please click "Next" to ensure your responses are recorded.**

French Survey

Section 1

La Société canadienne de physiologie de l'exercice (SCPE) est la propriétaire et la détentrice des droits d'auteur, ainsi que l'organisme national dirigeant l'élaboration des *Directives canadiennes en matière de mouvement sur 24 heures pour les adultes* et des *Directives canadiennes en matière de mouvement sur 24 heures pour les aînés*. L'Université Queen's réalise cette enquête au nom de la SCPE. Le financement de ces Directives a été fourni par l'Agence de la santé publique du Canada.

Section 2: Lettre d'information

Titre de l'étude : Examiner les perceptions et les approches à l'égard de la marque pour les Directives canadiennes en matière de mouvement sur 24 heures pour les adultes et les aînés.

Chercheuse principale : Jennifer Tomasone, professeure, School of Kinesiology and Health Studies, Université Queen's.

Après avoir examiné les données probantes, des experts ont produit des versions préliminaires des Directives canadiennes en matière de mouvement sur 24 heures pour les adultes et les aînés. En tant qu'intervenante ou intervenant travaillant au Canada dans le domaine des comportements en lien avec l'activité physique, la sédentarité ou le sommeil, vous êtes invité(e) à participer à une enquête où l'on vous demandera votre opinion sur ces versions préliminaires des Directives en matière de mouvement sur 24 heures. On vous demandera votre rétroaction et votre niveau d'accord avec le contenu des Directives en matière de mouvement sur 24 heures. Cette information est importante pour orienter les efforts stratégiques en matière de politiques, de pratique et de promotion de la santé auprès des adultes et des aînés canadiens.

Aucun risque direct n'est associé à la participation à cette enquête. En revanche, vous pourriez tirer profit d'une exposition précoce aux Directives en matière de mouvement sur 24 heures et être mieux outillé(e) pour en faire la promotion et les mettre en œuvre. La participation à cette enquête se fait une base volontaire et devrait prendre environ 20 min. Vous n'êtes pas dans l'obligation de répondre à toutes les questions. Vous pouvez mettre fin à votre participation en tout temps sans pénalité. Dans le cadre de cette enquête, vous n'avez pas à fournir votre nom et votre adresse courriel, et les réponses seront présentées sous forme agrégée. Puisque les données sont anonymes, il n'est pas possible de se retirer de l'enquête après y avoir participé. L'équipe de l'étude aura accès aux données que vous fournirez dans le cadre de cette étude durant et après la collecte des données. Le General Research Ethics Board (GREB) [Comité d'éthique de la recherche] de l'Université Queen's pourrait demander accès aux données de l'étude pour veiller à ce que les chercheurs aient satisfait ou satisfassent à leurs obligations éthiques dans le cadre de cette recherche. Le GREB a l'obligation de protéger la confidentialité et ne divulguera aucun renseignement personnel. Vos données seront stockées de manière sécurisée pendant au moins cinq ans, conformément aux politiques de l'Université Queen's. Après cinq ans, vos données seront archivées. Les résultats de cette enquête seront diffusés à des parties jouant un rôle dans l'élaboration et la promotion des Directives canadiennes en matière de mouvement sur 24 heures pour les adultes et les aînés.

Si vous avez des questions au sujet de la recherche, veuillez communiquer avec la chercheuse principale à tomasone@queensu.ca ou au 613-533-6000, poste 79193.

Si vous avez des préoccupations relativement à l'éthique, veuillez communiquer avec le General Research Ethics Board (GREB) au 1-844-535-2988 (sans frais en Amérique du Nord) ou par courriel à chair.GREB@queensu.ca.

Vous n'avez renoncé à aucun droit en consentant à participer à cette étude.

Veuillez prendre note que les Directives en sont présentement à un stade préliminaire et qu'une consultation auprès des intervenants est menée afin de connaître leur avis. Les versions finales des Directives seront publiées en octobre 2020. Puisque vous êtes une intervenante ou un intervenant apprécié(e) et digne de confiance, nous vous transmettons les recommandations confidentielles afin d'obtenir votre rétroaction. S'il vous plaît, ne partagez cette information avec personne. Si vous avez d'autres questions, veuillez communiquer avec le président du comité d'élaboration des Directives, M. Robert Ross, Ph. D., à rossr@queensu.ca.

En cliquant sur « Suivant » pour entamer l'enquête, vous consentez à y participer.

Merci pour votre temps!

Section 3

1. Quel âge avez-vous?

2. Quel est votre genre?

- ☐ Masculin
- ☐ Féminin
- ☐ Autre
- ☐ Je préfère ne pas répondre

3. Quelles sont les origines ethniques ou culturelles de vos ancêtres?

- ☐ Îles Britanniques (p. ex., anglaise, irlandaise, écossaise)
- ☐ Française
- ☐ Autre en Europe (p. ex., allemande, russe, italienne, norvégienne)
- ☐ Autochtone (p. ex., inuite, métisse, indienne de l'Amérique du Nord)
- ☐ Autre en Amérique du Nord (p. ex., canadienne, américaine, terre-neuvienne, québécoise)
- ☐ Caraïbes (p. ex., jamaïcaine, barbadienne, cubaine, antillaise)
- ☐ Amérique latine, centrale et du Sud (p. ex., mexicaine, argentine, guatémaliennne, péruvienne)
- ☐ Afrique (p. ex., sud-africaine, éthiopienne, nigérienne, zimbabwéenne)
- ☐ Péninsule arabe/Asie occidentale (p. ex., libanaise, marocaine, iranienne, turque)
- ☐ Asie du Sud (p. ex., indienne orientale, pakistanaise, de Goa, sri-lankaise)
- ☐ Chinoise
- ☐ Autre pays de l'Est et du Sud-Est asiatique (p. ex., philippine, vietnamienne, coréenne, japonaise)
- ☐ Océanie (p. ex., australienne, néo-zélandaise, fidjienne, samoane)
- ☐ Juive
- ☐ Autre - préciser

4. Veuillez indiquer la catégorie qui décrit le mieux le revenu annuel total de votre ménage, avant impôts.:

- ☐ Moins de 24 999 \$
- ☐ De 25 000 \$ à moins de 34 999 \$
- ☐ De 35 000 \$ à moins de 49 999 \$
- ☐ De 50 000 \$ à moins de 74 999 \$
- ☐ De 75 000 \$ à moins de 99 999 \$
- ☐ De 100 000 \$ à moins de 124 999 \$
- ☐ 125 000 \$ ou plus
- ☐ Ne sais pas/préfère ne pas répondre

5. Quel est le plus haut niveau de scolarité que vous avez atteint?

- ☐ Aucun certificat, diplôme ou grade
- ☐ Diplôme d'études secondaires ou l'équivalent
- ☐ Certificat ou diplôme d'apprenti ou d'une école de métiers
- ☐ Certificat ou diplôme d'un collège, d'un cégep ou d'un autre établissement non universitaire
- ☐ Certificat ou diplôme universitaire inférieur au baccalauréat
- ☐ Certificat, diplôme ou grade universitaire au niveau du baccalauréat ou supérieur : baccalauréat; certificat ou diplôme universitaire supérieur au baccalauréat; diplôme en médecine, en médecine dentaire, en médecine vétérinaire ou en optométrie; maîtrise; doctorat acquis.

6. À quel(s) secteur(s) êtes-vous associé(e)? Veuillez sélectionner toutes les réponses applicables.

- ☐ Sport
- ☐ Éducation
- ☐ Loisirs
- ☐ Soins aux aînés
- ☐ Soins de santé
- ☐ Santé publique
- ☐ Organisation non gouvernementale
- ☐ Recherche

- ☐ Gouvernement
☐ Autre, veuillez préciser :

7. Êtes-vous membre du Réseau de recherche sur le comportement sédentaire?

- ☐ Oui
☐ Non

8. Où travaillez-vous principalement?

- ☐ Alberta
☐ Colombie-Britannique
☐ Manitoba
☐ Nouveau-Brunswick
☐ Terre-Neuve et Labrador
☐ Nouvelle-Écosse
☐ Territoires-du-Nord-Ouest
☐ Nunavut
☐ Ontario
☐ Île-du-Prince-Édouard
☐ Québec
☐ Saskatchewan
☐ Yukon
☐ Au Canada (c.-à-d. au niveau national)
☐ À l'extérieur du Canada, veuillez préciser

Section 4

Nous vous demandons maintenant de répondre à des questions au sujet des Directives canadiennes en matière de mouvement sur 24 heures pour les adultes et les aînés. Toute différence entre les deux Directives est soulignée.

TITRE : Directives canadiennes en matière de mouvement sur 24 heures pour les **adultes (âgés de 18 à 64 ans)** : une approche intégrée regroupant l'activité physique, le comportement sédentaire et le sommeil

TITRE : Directives canadiennes en matière de mouvement sur 24 heures pour les **aînés (âgés de 65 ans et plus)** : une approche intégrée regroupant l'activité physique, le comportement sédentaire et le sommeil

1. Les titres sont énoncés clairement.

- ☐ Fortement en accord
☐ Plutôt en accord
☐ Ni en accord, ni en désaccord
☐ Plutôt en désaccord
☐ Fortement en désaccord

2. Je suis _____ avec la façon dont les titres sont énoncés.

- ☐ Fortement en accord
☐ Plutôt en accord
☐ Ni en accord, ni en désaccord
☐ Plutôt en désaccord
☐ Fortement en désaccord

3. Dans la zone de texte ci-dessous, veuillez indiquer tout commentaire concernant les titres.

Section 5

Veuillez prendre note que l'objectif du préambule est de fournir du contexte pour les Directives canadiennes en matière de mouvement sur 24 heures.

PRÉAMBULE POUR LES ADULTES

Ces Directives en matière de mouvement sur 24 heures s'appliquent à tous les **adultes (âgés de 18 à 64 ans)**, sans égard au genre, à l'héritage culturel ou au statut socioéconomique. Ces directives pourraient convenir **aux femmes enceintes** ou aux personnes vivant avec un handicap ou un trouble médical. Toutefois, ces personnes devraient envisager de consulter le *Questionnaire Menez une vie plus active*, des recommandations s'adressant spécifiquement aux personnes vivant avec un handicap ou un trouble médical, ou encore un professionnel de la santé pour obtenir des conseils.

Les adultes devraient participer à une gamme d'activités physiques (p. ex. activités avec ou sans mise en charge, sports et loisirs) dans une variété d'environnements (p. ex. à la maison/au travail/dans la communauté; à l'intérieur/à l'extérieur; sur le sol/dans l'eau) et de contextes (p. ex. loisirs, transport, travail, maison) pendant toutes les saisons. Les adultes devraient limiter les périodes prolongées de comportements sédentaires et adopter une hygiène en matière de sommeil saine (routines, comportements et environnements qui amènent à bien dormir).

Suivre ces Directives en matière de mouvement sur 24 heures est associé à un risque réduit de mortalité, de maladies cardiovasculaires, d'hypertension, de diabète de type 2, de plusieurs cancers, d'anxiété, de dépression, de démence, de gain de poids et de profil des lipides sanguins indésirable, et à une amélioration de la santé osseuse, de la cognition, de la qualité de vie et de la fonction physique. Les avantages associés à l'adoption de ces directives surpassent de loin les torts potentiels.

Ces Directives en matière de mouvement sur 24 heures sont basées sur les meilleures données probantes disponibles, un consensus d'experts, des consultations auprès des intervenants, et des facteurs associés aux valeurs et aux préférences, à l'applicabilité, à la faisabilité et à l'équité. Plus de renseignements sur les directives, la recherche ayant mené à leur mise au point et sur leur interprétation, ainsi que des conseils pour les mettre en application et des recommandations sur la recherche et la surveillance sont disponibles à <https://scoe.ca/directives/>.

PRÉAMBULE POUR LES AÎNÉS

Ces Directives en matière de mouvement sur 24 heures s'appliquent à tous les **aînés (âgés de 65 ans et plus)**, sans égard au genre, à l'héritage culturel ou au statut socioéconomique. Ces directives pourraient convenir aux adultes vivant avec un handicap ou un trouble médical. Toutefois, ces personnes devraient envisager de consulter le *Questionnaire Menez une vie plus active*, des recommandations s'adressant spécifiquement aux personnes vivant avec un handicap ou un trouble médical, ou encore un professionnel de la santé pour obtenir des conseils.

Les **aînés** devraient participer à une gamme d'activités physiques (p. ex. activités avec ou sans mise en charge, sports et loisirs) dans une variété d'environnements (p. ex. à la maison/au travail/dans la communauté; à l'intérieur/à l'extérieur; sur le sol/dans l'eau) et de contextes (p. ex. loisirs, transport, travail, maison) pendant toutes les saisons. Les **aînés** devraient limiter les périodes prolongées de comportements sédentaires et adopter une hygiène en matière de sommeil saine (routines, comportements et environnements qui amènent à bien dormir).

Suivre ces Directives en matière de mouvement sur 24 heures est associé à un risque réduit de mortalité, de maladies cardiovasculaires, d'hypertension, de diabète de type 2, de plusieurs cancers, d'anxiété, de dépression, de démence, de gain de poids, de profil des lipides sanguins indésirable, **de chutes et de blessures liées à des chutes**, et à une amélioration de la santé osseuse, de la

cognition, de la qualité de vie et de la fonction physique. Les avantages associés à l'adoption de ces directives surpassent de loin les torts potentiels.

Ces Directives en matière de mouvement sur 24 heures sont basées sur les meilleures données probantes disponibles, un consensus d'experts, des consultations auprès des intervenants, et des facteurs associés aux valeurs et aux préférences, à l'applicabilité, à la faisabilité et à l'équité. Plus de renseignements sur les directives, la recherche ayant mené à leur mise au point et sur leur interprétation, ainsi que des conseils pour les mettre en application et des recommandations sur la recherche et la surveillance sont disponibles à <https://scpe.ca/directives/>.

1. Les préambules sont énoncés clairement.

- ☐ Fortement en accord
- ☐ Plutôt en accord
- ☐ Ni en accord, ni en désaccord
- ☐ Plutôt en désaccord
- ☐ Fortement en désaccord

2. Je suis _____ avec la façon dont les préambules sont énoncés.

- ☐ Fortement en accord
- ☐ Plutôt en accord
- ☐ Ni en accord, ni en désaccord
- ☐ Plutôt en désaccord
- ☐ Fortement en désaccord

3. J'utiliserais (p. ex. distribuerais) les préambules.

- ☐ Fortement en accord
- ☐ Plutôt en accord
- ☐ Ni en accord, ni en désaccord
- ☐ Plutôt en désaccord
- ☐ Fortement en désaccord

4. Dans la zone de texte ci-dessous, veuillez indiquer tout commentaire concernant les préambules.

Section 6

La version préliminaire des Directives canadiennes en matière de mouvement sur 24 heures pour les adultes et les aînés est présentée ci-dessous.

DIRECTIVES POUR LES ADULTES

Pour obtenir des bienfaits pour la santé, les **adultes** devraient être physiquement actifs chaque jour, limiter les comportements sédentaires et dormir suffisamment.

Un 24 heures sain comprend :

Une variété de types et d'intensités d'activité physique, ce qui inclut :

- Des activités physiques aérobies d'intensité moyenne à élevée d'une durée cumulative d'au moins 150 minutes par semaine
- Des activités pour renforcer les muscles et faisant appel aux groupes musculaires importants au moins deux fois par semaine
- Plusieurs heures d'activités physiques d'intensité légère, incluant des périodes en position debout

Un maximum de 8 heures de sédentarité, ce qui inclut :

- Un maximum de 3 heures de temps de loisir devant un écran, et
- Une interruption aussi fréquente que possible des périodes prolongées en position assise

De 7 à 9 heures de sommeil de bonne qualité sur une base régulière avec des heures de coucher et de lever régulières.

Remplacer les comportements sédentaires par plus d'activité physique, et remplacer l'activité physique de faible intensité par plus d'activité physique d'intensité moyenne à élevée, tout en maintenant une durée de sommeil suffisante, entraînent encore plus de bienfaits pour la santé.

Tout progrès vers l'atteinte de l'une ou l'autre des cibles mentionnées ci-dessus entraînera des bienfaits pour la santé.

DIRECTIVES POUR LES AÎNÉS

Pour obtenir des bienfaits pour la santé, les **aînés** devraient être physiquement actifs chaque jour, limiter les comportements sédentaires et dormir suffisamment.

Un 24 heures sain comprend :

Une variété de types et d'intensités d'activité physique, ce qui inclut

- Des activités physiques aérobies d'intensité moyenne à élevée d'une durée cumulative d'au moins 150 min par semaine
- Des activités pour renforcer les muscles et faisant appel aux groupes musculaires importants au moins deux fois par semaine
- Des activités physiques qui font appel à l'équilibre
- Plusieurs heures d'activités physiques d'intensité légère, incluant des périodes en position debout

Un maximum de 8 heures de sédentarité, ce qui inclut

- Un maximum de 3 heures de temps de loisir devant un écran, et
- Une interruption aussi fréquente que possible des périodes prolongées en position assise

De 7 à 8 heures de sommeil de bonne qualité sur une base régulière avec des heures de coucher et de lever régulières.

Remplacer les comportements sédentaires par plus d'activité physique, et remplacer l'activité physique de faible intensité par plus d'activité physique d'intensité moyenne à élevée, tout en maintenant une durée de sommeil suffisante, entraînent encore plus de bienfaits pour la santé.

Tout progrès vers l'atteinte de l'une ou l'autre des cibles mentionnées ci-dessus entraînera des bienfaits pour la santé.

Nous aimerions avoir votre rétroaction sur chaque recommandation dans les questions qui suivent.

RECOMMANDATIONS EN MATIÈRE D'ACTIVITÉ PHYSIQUE POUR LES ADULTES

Un 24 heures sain comprend :

Une variété de types et d'intensités d'activité physique, ce qui inclut :

- Des activités physiques aérobies d'intensité moyenne à élevée d'une durée cumulative d'au moins 150 minutes par semaine
- Des activités pour renforcer les muscles et faisant appel aux groupes musculaires importants au moins deux fois par semaine
- Plusieurs heures d'activités physiques d'intensité légère, incluant des périodes en position debout

RECOMMANDATIONS EN MATIÈRE D'ACTIVITÉ PHYSIQUE POUR LES AÎNÉS

Un 24 heures sain comprend :

Une variété de types et d'intensités d'activité physique, ce qui inclut

- Des activités physiques aérobies d'intensité moyenne à élevée d'une durée cumulative d'au moins 150 minutes par semaine
- Des activités pour renforcer les muscles et faisant appel aux groupes musculaires importants au moins deux fois par semaine
- Des activités physiques qui font appel à l'équilibre
- Plusieurs heures d'activités physiques d'intensité légère, incluant des périodes en position debout

1. Les recommandations en matière d'activité physique sont énoncées clairement.

- ☐ Fortement en accord
☐ Plutôt en accord
☐ Ni en accord, ni en désaccord
☐ Plutôt en désaccord
☐ Fortement en désaccord

2. Je suis _____ avec la façon dont les recommandations en matière d'activité physique sont énoncées.

- ☐ Fortement en accord
☐ Plutôt en accord
☐ Ni en accord, ni en désaccord
☐ Plutôt en désaccord
☐ Fortement en désaccord

3. Dans la zone de texte ci-dessous, veuillez indiquer tout commentaire concernant les recommandations en matière d'activité physique.

RECOMMANDATIONS EN MATIÈRE DE COMPORTEMENT SÉDENTAIRE

Un 24 heures sain comprend :

Un maximum de 8 heures de sédentarité, ce qui inclut :

- Un maximum de 3 heures de temps de loisir devant un écran, et
- Une interruption aussi fréquente que possible des périodes prolongées en position assise

4. Les recommandations en matière de comportement sédentaire sont énoncées clairement.

- ☐ Fortement en accord
☐ Plutôt en accord
☐ Ni en accord, ni en désaccord
☐ Plutôt en désaccord
☐ Fortement en désaccord

5. Je suis _____ avec la façon dont les recommandations en matière de comportement sédentaire sont énoncées.

- ☐ Fortement en accord
☐ Plutôt en accord
☐ Ni en accord, ni en désaccord
☐ Plutôt en désaccord
☐ Fortement en désaccord

6. Dans la zone de texte ci-dessous, veuillez indiquer tout commentaire concernant les recommandations en matière de comportement sédentaire.

RECOMMANDATIONS EN MATIÈRE DE SOMMEIL POUR LES ADULTES

Un 24 heures sain comprend :

De 7 à 9 heures de sommeil de bonne qualité sur une base régulière avec des heures de coucher et de lever régulières.

RECOMMANDATIONS EN MATIÈRE DE SOMMEIL POUR LES ÂÎNÉS

Un 24 heures sain comprend :

De 7 à 8 heures de sommeil de bonne qualité sur une base régulière avec des heures de coucher et de lever régulières.

7. Les recommandations en matière de sommeil sont énoncées clairement.

- ☐ Fortement en accord
☐ Plutôt en accord

- ☐ Ni en accord, ni en désaccord
☐ Plutôt en désaccord
☐ Fortement en désaccord

8. Je suis _____ avec la façon dont les recommandations en matière de sommeil sont énoncées.

- ☐ Fortement en accord
☐ Plutôt en accord
☐ Ni en accord, ni en désaccord
☐ Plutôt en désaccord
☐ Fortement en désaccord

9. Dans la zone de texte ci-dessous, veuillez indiquer tout commentaire concernant les recommandations en matière de sommeil.

RECOMMANDATION INTÉGRÉE POUR LES ADULTES

Pour obtenir des bienfaits pour la santé, les **adultes** devraient être physiquement actifs chaque jour, limiter les comportements sédentaires et dormir suffisamment.

Remplacer les comportements sédentaires par plus d'activité physique, et remplacer l'activité physique de faible intensité par plus d'activité physique d'intensité moyenne à élevée, tout en maintenant une durée de sommeil suffisante, entraînent encore plus de bienfaits pour la santé.

Tout progrès vers l'atteinte de l'une ou l'autre des cibles mentionnées ci-dessus entraînera des bienfaits pour la santé.

RECOMMANDATION INTÉGRÉE POUR LES ÂÎNÉS

Pour obtenir des bienfaits pour la santé, les **âînés** devraient être physiquement actifs chaque jour, limiter les comportements sédentaires et dormir suffisamment.

Remplacer les comportements sédentaires par plus d'activité physique, et remplacer l'activité physique de faible intensité par plus d'activité physique d'intensité moyenne à élevée, tout en maintenant une durée de sommeil suffisante, entraînent encore plus de bienfaits pour la santé.

Tout progrès vers l'atteinte de l'une ou l'autre des cibles mentionnées ci-dessus entraînera des bienfaits pour la santé.

10. Les recommandations intégrées sont énoncées clairement.

- ☐ Fortement en accord
☐ Plutôt en accord
☐ Ni en accord, ni en désaccord
☐ Plutôt en désaccord
☐ Fortement en désaccord

11. Je suis _____ avec la façon dont la recommandation intégrée est énoncée.

- ☐ Fortement en accord
☐ Plutôt en accord
☐ Ni en accord, ni en désaccord
☐ Plutôt en désaccord
☐ Fortement en désaccord

12. Dans la zone de texte ci-dessous, veuillez indiquer tout commentaire concernant la recommandation intégrée.

Section 7

La version préliminaire des Directives canadiennes en matière de mouvement sur 24 heures pour les adultes et les âînés est présentée ci-dessous.

DIRECTIVES POUR LES ADULTES

Pour obtenir des bienfaits pour la santé, les **adultes** devraient être physiquement actifs chaque jour, limiter les comportements sédentaires et dormir suffisamment.

Un 24 heures sain comprend :

Une variété de types et d'intensités d'activité physique, ce qui inclut :

- Des activités physiques aérobies d'intensité moyenne à élevée d'une durée cumulative d'au moins 150 minutes par semaine
- Des activités pour renforcer les muscles et faisant appel aux groupes musculaires importants au moins deux fois par semaine
- Plusieurs heures d'activités physiques d'intensité légère, incluant des périodes en position debout

Un maximum de 8 heures de sédentarité, ce qui inclut :

- Un maximum de 3 heures de temps de loisir devant un écran, et
- Une interruption aussi fréquente que possible des périodes prolongées en position assise

De 7 à 9 heures de sommeil de bonne qualité sur une base régulière avec des heures de coucher et de lever régulières

Remplacer les comportements sédentaires par plus d'activité physique, et remplacer l'activité physique de faible intensité par plus d'activité physique d'intensité moyenne à élevée, tout en maintenant une durée de sommeil suffisante, entraînent encore plus de bienfaits pour la santé.

Tout progrès vers l'atteinte de l'une ou l'autre des cibles mentionnées ci-dessus entraînera des bienfaits pour la santé.

DIRECTIVES POUR LES AÎNÉS

Pour obtenir des bienfaits pour la santé, les **aînés** devraient être physiquement actifs chaque jour, limiter les comportements sédentaires et dormir suffisamment.

Un 24 heures sain comprend :

Une variété de types et d'intensités d'activité physique, ce qui inclut

- Des activités physiques aérobies d'intensité moyenne à élevée d'une durée cumulative d'au moins 150 min par semaine
- Des activités pour renforcer les muscles et faisant appel aux groupes musculaires importants au moins deux fois par semaine
- Des activités physiques qui font appel à l'équilibre
- Plusieurs heures d'activités physiques d'intensité légère, incluant des périodes en position debout

Un maximum de 8 heures de sédentarité, ce qui inclut

- Un maximum de 3 heures de temps de loisir devant un écran, et
- Une interruption aussi fréquente que possible des périodes prolongées en position assise

De 7 à 8 heures de sommeil de bonne qualité sur une base régulière avec des heures de coucher et de lever régulières.

Remplacer les comportements sédentaires par plus d'activité physique, et remplacer l'activité physique de faible intensité par plus d'activité physique d'intensité moyenne à élevée, tout en maintenant une durée de sommeil suffisante, entraînent encore plus de bienfaits pour la santé.

Tout progrès vers l'atteinte de l'une ou l'autre des cibles mentionnées ci-dessus entraînera des bienfaits pour la santé.

UTILISATION DES DIRECTIVES CANADIENNES EN MATIÈRE DE MOUVEMENT SUR 24 HEURES

1. À quel point les Directives canadiennes en matière de mouvement sur 24 heures sont-elles importantes pour vous dans le cadre de votre travail?

- ☐ Très importantes
- ☐ Importantes
- ☐ Modérément importantes

- ☐ Peu importantes
- ☐ Pas importantes du tout

2. Dans la zone de texte ci-dessous, veuillez indiquer tout commentaire concernant la question précédente.

3. À quel point les Directives canadiennes en matière de mouvement sur 24 heures sont-elles pertinentes dans le cadre de votre travail?

- ☐ Très pertinentes
- ☐ Pertinentes
- ☐ Modérément pertinentes
- ☐ Peu pertinentes
- ☐ Pas pertinentes du tout

4. Dans la zone de texte ci-dessous, veuillez indiquer tout commentaire concernant la question précédente.

5. À quelle fréquence utiliseriez-vous les Directives canadiennes en matière de mouvement sur 24 heures dans le cadre de votre travail?

- ☐ Toujours
- ☐ Souvent
- ☐ Occasionnellement
- ☐ Rarement
- ☐ Jamais

6. Dans la zone de texte ci-dessous, veuillez indiquer tout commentaire concernant la question précédente.

7. À quel point serait-il facile ou difficile pour vous d'utiliser les Directives canadiennes en matière de mouvement sur 24 heures?

- ☐ Très facile
- ☐ Assez facile
- ☐ Ni facile ni difficile
- ☐ Assez difficile
- ☐ Très difficile

8. Comparativement aux directives distinctes sur les comportements en matière de mouvements, les Directives canadiennes en matière de mouvement sur 24 heures intégrées sont...

- ☐ Beaucoup plus utiles
- ☐ Plus utiles
- ☐ Neutres
- ☐ Moins utiles
- ☐ Beaucoup moins utiles

9. Dans la zone de texte ci-dessous, veuillez indiquer tout commentaire concernant la question précédente.

10. Les coûts pour vous-même ou votre organisation associés à la mise en œuvre des Directives canadiennes en matière de mouvement sur 24 heures sont susceptibles d'être faibles ou négligeables comparativement à une absence d'utilisation des Directives.

- ☐ Fortement en accord
- ☐ Plutôt en accord
- ☐ Ni en accord, ni en désaccord

- ☐ Plutôt en désaccord
- ☐ Fortement en désaccord
- ☐ Je ne sais pas

11. Dans la zone de texte ci-dessous, veuillez indiquer tout commentaire concernant la question précédente.

12. Les avantages associés à l'utilisation des Directives canadiennes en matière de mouvement sur 24 heures sont susceptibles de l'emporter sur les coûts (p. ex. temps, finances, possibilités, etc.) dans le cadre de votre travail.

- ☐ Fortement en accord
- ☐ Plutôt en accord
- ☐ Ni en accord, ni en désaccord
- ☐ Plutôt en désaccord
- ☐ Fortement en désaccord
- ☐ Je ne sais pas

13. Dans la zone de texte ci-dessous, veuillez indiquer tout commentaire concernant la question précédente.

14. L'adoption des Directives en matière de mouvement sur 24 heures est susceptible d'entraîner des bienfaits pour les adultes et les aînés canadiens sans égard au genre, à la race, à l'origine ethnique ou au statut socioéconomique.

- ☐ Fortement en accord
- ☐ Plutôt en accord
- ☐ Ni en accord, ni en désaccord
- ☐ Plutôt en désaccord
- ☐ Fortement en désaccord
- ☐ Je ne sais pas

15. Dans la zone de texte ci-dessous, veuillez indiquer tout commentaire concernant la question précédente.

16. À votre avis, qui seraient les intermédiaires clés pour assurer la mise en œuvre des Directives canadiennes en matière de mouvement sur 24 heures (p. ex. les médecins de soins primaires)?

17. À votre avis, de quel type de soutien ces intermédiaires auraient-ils besoin pour assurer la mise en œuvre des Directives canadiennes en matière de mouvement sur 24 heures (p. ex., ressources, formation)?

18. Dans la zone de texte ci-dessous, veuillez indiquer tout autre commentaire concernant les Directives canadiennes en matière de mouvement sur 24 heures.

Section 8

Nous vous remercions de l'intérêt que vous portez aux Directives canadiennes en matière de mouvement sur 24 heures pour les adultes et les aînés. Les recommandations sont en forme préliminaires et des consultations sont en cours. Les versions finales des directives seront publiées en octobre 2020. Puisque vous êtes un membre du public apprécié et digne de confiance, nous avons partagé les recommandations confidentielles pour vos commentaires. S'il vous plaît, ne partagez cette information avec personne. Si vous avez d'autres questions, veuillez communiquer avec le président de l'élaboration des directives, M. Robert Ross, à rossr@queensu.ca. **Veuillez cliquer sur « Suivant » pour vous assurer que vos réponses sont enregistrées.**

Appendix B. Example of public-facing material

Following the Canadian 24-Hour Movement Guidelines for Adults can help you obtain health benefits and live your best life.



Make your whole day matter.



MOVE MORE

Add movement throughout your day, including a variety of types and intensities of physical activity and muscle strengthening activities.



REDUCE SEDENTARY TIME

Limit recreational screen time and break up sedentary time often.



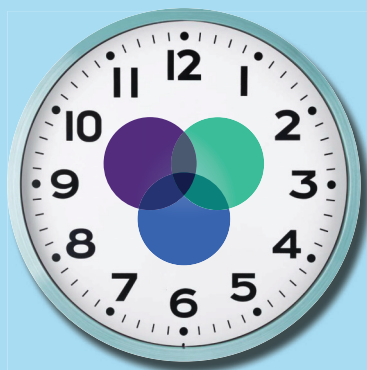
SLEEP WELL

Set yourself up for good-quality sleep on a regular basis, with consistent bed and wake-up times.

Learn more at csepguidelines.ca

Appendix B (concluded).

Suivre les Directives canadiennes en matière de mouvement sur 24 heures pour les adultes peut vous apporter des bienfaits santé et vous aider à réaliser votre plein potentiel.



Profitez au maximum de votre journée.



BOUGEZ PLUS

Ajoutez du mouvement à votre journée, dont une variété d'activités physiques à différentes intensités ainsi que des activités pour renforcer les muscles.



SOYEZ MOINS SÉDENTAIRE

Limitez le temps de loisir consacré aux écrans et interrompez souvent les périodes sédentaires.



DORMEZ BIEN

Créez des conditions qui favorisent un sommeil de qualité, avec des heures de lever et de coucher régulières.

Visitez csepguidelines.ca/fr pour en savoir plus



Agence de la santé
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Agency of Canada

